Journal of the

AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. VIII, NO. 1 JANUARY, 1947 CONSECUTIVE NO. 1

Practical Pharmacy Edition

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ANOTHER TIME OF DECISION

LEGISLATION reorganizing the Army constitutes an important job facing the new 80th Congress. Woven into the fabric of this complex task is the fate of the Pharmacy Corps. Sparsely staffed and long neglected by the Army, its unhappy history has become more or less familiar to all of us. Unfortunately the limited scope of the Pharmacy Corps Act itself holds little promise for the future unless the Surgeon General carries out the intent of Congress as expressed by the Committee that reported the bill favorably to Congress. This he is reluctant to do.

The Surgeon General's views on how best to utilize the services of pharmacists appear in a bill for a Medical Service Corps, which includes a Pharmacy Section among other groups of specialists allied to medicine.

Where the situation stands at present is brought out in the latest report of the Steering Committee of the Committee on Status of Pharmacists in Government Service, printed in full on page 29. All pharmacy has backed this Committee's efforts to preserve and activate the embryonic Pharmacy Corps. A. PH. A. reaffirmed its support of that objective by action of the House of Delegates as recently as the 1946 meeting. At the same time the ASSOCIATION recognized that final decisions must be left to the Committee, and joined with other organizations represented on it to extend authority "to act in any situation which may develop with respect to legislation affecting the status of pharmacy."

The "situation" will soon develop in the current session of Congress when the proposed Medical Service Corps bill goes into the hopper. We may expect strong backing of the Army's program from high places both in and out of Congress. In supporting the Pharmacy Corps we must face the trend toward consolidation of military subdivisions—even to a merger of the Army and Navy themselves.

Pharmacists who have acquired an interest in the development of Army pharmacy—and that seems to include most of us—should give the Steering Committee's report a careful reading. From this emerges the basic issue: How can pharmacy officers be best integrated with other branches of the Medical Department to provide the most comprehensive service?

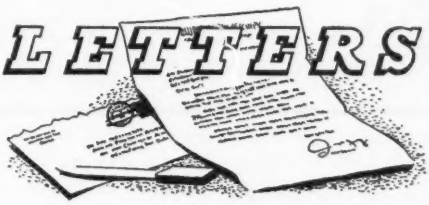
We have utmost confidence that the final decision and course of action by the Committee on Status of Pharmacists in Government Service will be in the best interests of the profession and of maximum service to the men of the armed forces. It is well to recall that this Committee is a joint one composed of able representatives from the N. A. R. D., A. PH. A., A. A. C. P. and N. A. B. P., men thoroughly familiar with the complex factors in the problem that confronts them. We have the right to expect that pharmacy in the peacetime Army will fulfill the original intent of the Pharmacy Corps. When the Committee reaches a decision as to how this may best be achieved, its course of action should be supported with confidence by pharmacists.

AFTER SIXTEEN YEARS

THE U. S. Public Health Service examination to be held in March and April for pharmacy appointments in the Regular Corps (see page 21) represents further evidence that government agencies are awakening to the higher status and service of modern pharmacy. This will be the first competitive examination for pharmacists since 1930, when the original appointments were made under the old Parker Bill. We hope it is a welcome sign of things to come, since the need for Regular pharmacy officers—of which there are now only three—seems well established.

There are, of course, some twenty pharmacists serving in the Reserve Corps, and perhaps an equal number under Civil Service. Even the needs of the Service's network of marine hospitals would appear to require more than this total number, however, judged by civilian standards of pharmaceutical service. Any deficiencies that may exist are no doubt partially due to the difficulty of obtaining qualified personnel in these times, a handicap that should be lessened by the decision to hold examinations for the Regular Corps. These are career jobs offering permanent tenure of office and regular promotions.

Most such posts will undoubtedly be in hospital pharmacy, a field of practice of increasing importance both in and out of government service. It is also gratifying to note in the announcement that consideration will be given to placing properly qualified pharmacists in research posts, as well as in medical supply and quarantine inspection where pharmacists already serve capably.



REQUIRED COURSES IN HOSPITAL PHARMACY

Sirs:

I have noted a statement in the column by John Zugich, November issue, page 515, which seems a bit out of line with the facts.

In answering the question, "What schools offer courses leading to a major in hospital pharmacy?" the statement is made that "at the undergraduate level, there are no courses in hospital pharmacy beyond that of an elective." At Western Reserve University we are offering a three-hour course in hospital pharmacy as a required course for all undergraduate students in pharmacy and have been since 1928.

Our course in manufacturing pharmacy is also required and is directly applicable to procedures employed in the complete hospital pharmacy. In fact the products are actually utilized in the University Hospitals. Advanced courses are offered in both fields to permit graduate study toward graduate degrees.

In all fairness to your excellent publication, this minor criticism should be accompanied by a word of praise for the over-all product. . . .

Western Reserve University — ARTHUR P. WYSS
Cleveland, Ohio

A CORDIAL WELCOME

Sirs:

I wish to thank you for your courtesies when I recently visited A. PH. A. headquarters during my stay in Washington, D. C. To say that I was much surprised, and at the same time quite proud of this building is putting it mildly. Any pharmacist who goes to Washington should make an effort to visit the AMERICAN PHARMACEUTICAL ASSOCIATION and see the building.

If you will send me an application blank I shall be glad to become a member.

Munfordville, Ky. — A. C. WELLS

A. Ph. A. extends thanks to Mr. Wells and a cordial welcome to all other pharmacists who have occasion to visit the nation's capital.—THE EDITOR

COMMENTS FROM MEMBERS AND SUBSCRIBERS

Sirs:

I am renewing my subscription for 1947 and wish to have the JOURNAL mailed to my home for my personal library. I also requested Barnes Hospital to subscribe so that we may have both editions in the clinic pharmacy. The young physician can learn a great deal, and appreciate what the pharmacist means to him, through reading the JOURNALS.

Since the hospital pharmacist is the intern's first contact with pharmacy, he can either gain respect or leave a poor impression regarding the profession.

St. Louis, Mo. — NORMAN E. HAMMELMAN

Sirs:

Please renew my membership in the A. PH. A. for 1947. I have enclosed $7 which will cover both the dues and the JOURNALS.

I have been a member for a year now and have enjoyed it very much. Both publications put out by the ASSOCIATION are received regularly and I find them very helpful. Keep up the good work!

San Francisco, Calif. — CLEMENT LEW

Sirs:

Enclosed is a check covering the annual dues and a copy of the A. PH. A. *Pharmaceutical Recipe Book.*

Thanking you for all you have done in behalf of the pharmacists.

Philadelphia, Pa. — CHARLES S. KUMKUMIAN

Sirs:

Please change my mailing address for the JOURNAL, *Practical Pharmacy Edition.* I have missed several copies since coming here from Alexandria, Minn., and I feel lost without it.

Tucson, Ariz. — E. R. WESTERBERG

REPAYING A DEBT TO ANIMAL EXPERIMENTATION

Sirs:

The JOURNAL is to be commended for publishing the series of articles supporting animal experimentation [September issue]. Since pharmacists have more daily contact with people than any other professional group, don't you think that they are in an enviable position for educating the general public as to why animal experimentation is so important? Perhaps nation-wide use of a window display during some appointed week with awards for the best exhibit would be the most effective means.

At any rate, here is an opportunity for pharmacists to take the initiative to pay a debt they owe to men in research who have done much to advance professional pharmacy.

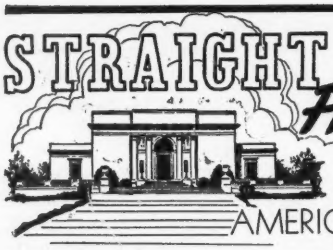
George Washington University — E. LEONG WAY
Washington, D. C.

FROM A NEW MEMBER

Sirs:

Thank you for arranging to change my status from a JOURNAL subscriber to a member of the ASSOCIATION. My only concern is that I do not miss an issue of the *Scientific Edition.* It is one of the most valuable publications I receive. . . .

Port Chester, N. Y. — ORVILLE E. MCKIM



STRAIGHT FROM HEADQUARTERS

by ROBERT P. FISCHELIS, Secretary
AMERICAN PHARMACEUTICAL ASSOCIATION

PHARMACY'S PROGRAM

FROM time to time pharmacy has been accused of having no program except to do what seems expedient at the moment. The same thing has been said of medicine, of education, of our foreign policy, of our domestic policy, of our political parties and of our nation as compared with totalitarian governments.

The fact is that we are not living in a static world. Change goes on continuously. The viewpoint of the individual changes as he acquires age, knowledge, experience and wisdom. The viewpoints of nations change as their people respond to leadership of various kinds and quality, as their people come into contact with the people of other nations and as their facilities for communication and interchange of views improve.

Pharmacy is subject to the same internal and external influences which influence other professions, states and nations. Therefore, a policy which seems perfectly sound today may have to be modified to remain sound tomorrow. We cannot expect complete unification of thought and action in every phase of pharmaceutical endeavor at every turn. Nor can we even approach desirable unanimity of thought and action without constant interchange of information and the existence among leaders in pharmacy and the drug industry of an understanding of the requirements of the entire field covered by this profession and industry as well as the social setting in which they operate.

IMPROVED COOPERATION

The facilities for interchange of information among pharmaceutical organizations have improved considerably in the past year. The National Drug Trade Conference has taken on a new lease of life. In place of a single annual meeting with no activity between meetings there have been subcommittees at work, holding meetings in Washington, and giving intensive study to such problems as uniform food, drug and cosmetic legislation, uniform legislation with respect to the distribution of poisons, narcotics, hypnotic drugs, veterinary remedies, caustic poisons and uniform legislation with respect to the control and distribution of drugs and the licensure of pharmacists by the various states. Meeting for such specific discussions and having committees composed of representatives from each of the divisions of the profession and industry, it is not at all surprising that a greater appreciation of respective viewpoints has come about.

It is to be hoped that this greater appreciation of one another's difficulties as well as the knowledge of the objectives toward which the profession is striving will lead to a more unified procedure on the part of all in connection with legislation affecting pharmacy, such as is sure to come up in the various states holding meetings of their legislatures during 1947.

In the past we have had a number of unfortunate clashes between the representatives of the proprietary medicine industry and representatives of the profession of pharmacy before committees of the legislatures of a number of states, when amendments to pharmacy laws were under consideration seeking to limit distribution of drug products to pharmacies and pharmacists. It is to be hoped that such situations will not recur this year.

PRACTICAL EXPERIENCE

In another section of this issue of the JOURNAL there is a discussion of the viewpoint of hospital pharmacists with respect to the practical experience requirements now in effect in the various states.

It has been the custom to require at least one year of practical experience in addition to college training as a prerequisite for registration as a pharmacist. The practical experience requirement is expected to provide for pharmacists what the internship provides for physicians. Training of this kind is indispensable. Hospital pharmacists have chafed under the requirement of the law which apparently limits recognition of practical experience to such as has been obtained in a retail pharmacy and, therefore, precludes credit-

ing experience acquired in a hospital pharmacy on an equal basis.

It is unfortunate that requirements such as this are too often considered and interpreted from a personal standpoint rather than from the standpoint of the general good and welfare. From the latter standpoint it was certainly incumbent upon Boards of Pharmacy many years ago to have devised standards and outlined minimum requirements. That this has only been accomplished very recently by the National Association of Boards of Pharmacy reflects no great credit on the Boards. However, it must be said to their credit that in quite a number of states efforts at standardization of practical experience in terms of hours, of specialized services and, in a few instances, in terms of prescribed practice have been made.

The reason hospital pharmacy is not recognized in most states as the equivalent in experience obtained under the supervision of a registered pharmacist in a pharmacy where physician's prescriptions are compounded and drugs are sold at retail is because there are many hospital pharmacies which are not operated under the supervision of licensed pharmacists. There are hospital pharmacies in which the routine of experience consists of filling ward baskets with the ordinary tablets, pills and liquids found at the ward stations on the different floors and occasionally compounding a prescription which is not one of a stock of ready-made remedies or hospital formulas. Obviously a person working under such conditions is gaining no experience which would enable him to manage a pharmacy or conduct a prescription laboratory.

The basis for requiring a license to practice pharmacy is to assure the public that the dispenser of drugs who holds a certificate from the state is competent to conduct a pharmacy and to do everything that a pharmacist may be called upon to do in the course of his professional practice.

The services a community pharmacist is expected to supply consist of much more than what can be learned in a hospital pharmacy of the kind described, in which the entire responsibility for the business management lies with the superintendent and the entire responsibility for the quality, character and kind of drugs dispensed lies with a physician or in some cases even with a nurse.

If every applicant for registration as pharmacist could have the experience which is obtainable in some of our well-conducted hospital pharmacies there would be no question about giving experience credit for work in a hospital pharmacy.

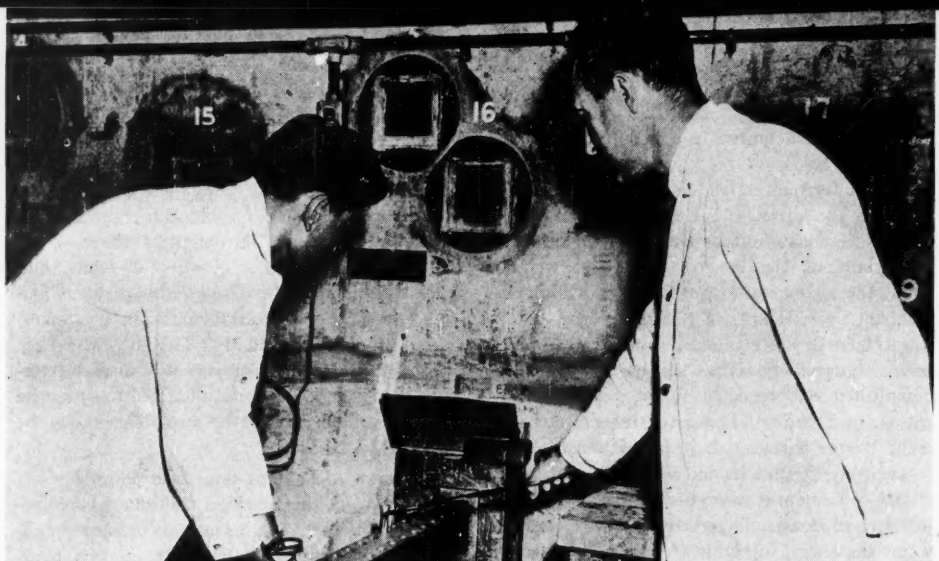
It is, of course, admitted that there are many pharmacies in which no well-rounded experience such as is essential to qualify an individual to conduct a pharmacy on his own responsibility can be obtained. This definitely narrows the controversy down to a question of what shall constitute adequate training and experience and which institutions or establishments are qualified to supply such training. Here it is necessary for some regulatory agency to step in and determine who is and who is not qualified to supervise experience and where the experience shall be obtained.

We know of at least one state pharmacy act which requires the Board of Pharmacy to determine whether a given pharmacy is or is not qualified to grant experience because the law reads that the applicant must have obtained the required amount of experience in a pharmacy approved by the Board for that purpose.

Hospital pharmacists have done well to raise the question of the extent of their ability to give adequate training but in raising the question they must be prepared to prove that their establishments are well enough equipped, well enough organized and required to do sufficiently extensive work to be able to provide well-rounded experience and to have capable licensed personnel available under whose supervision such experience can be obtained.

There should be no foolish discussion about the relative abilities of hospital pharmacists and pharmacy owners who conduct high-type professional establishments to supervise experience. This is certainly not the issue. The issue is, where can the recent graduate obtain the well-rounded experience that will justify the state in issuing to him a certificate which proclaims, in effect, that he is qualified to operate and conduct a pharmacy of any kind anywhere within the borders of the state.

Whenever this question has been answered satisfactorily, the laws of the respective states and the requirements of the respective Boards should be so set up as to determine what constitutes an approved training-pharmacy and under what conditions a prospective pharmacist shall obtain his approved training. Here is a problem which has plagued the profession for many years and on which relatively little has been done. The N. A. B. P. has made a start toward standardizing the practical experience requirement. It should now have the wholehearted cooperation of the profession in raising these standards and in making them effective just as promptly as possible.



Radioisotopes

PRODUCTION of radioactive isotopes in quantity brings medical and pharmaceutical science to full-scale development of a new frontier of research. As a by-product of the uranium chain-reacting pile that spawned the atomic bomb, radioisotopes represent one of the first peacetime contributions from man's explorations in the field of atomic energy.

Very limited quantities of radioisotopes, laboriously produced in atom-smashing cyclotrons during the past few years, have already provided a glimpse of what is to come. Using these substances in "tracer techniques," investigators have shown how little-understood physiologic reactions may be elucidated. Cautious experiments with radioisotopes for therapeutic use have brought limited success, and a hope that future work will provide an answer to some medical problems, especially the neoplastic diseases. With supplies of radioactive material readily available from the chain-reacting pile, pharmacists may expect many research results of importance to the profession.

Acknowledgments: For source material upon which this article is based, the JOURNAL is grateful to staff members of the Clinton Laboratories, Oak Ridge, Tenn., for their assistance during a personal visit by the editor, and to the American Pharmaceutical Manufacturers' Association for making available copies of discussions at the Atomic Energy Forum held at the December, 1946, meeting.

Last summer the first supplies of radioisotopes for investigations in the health field were released from the Clinton Laboratories, atomic research center at Oak Ridge, Tenn. By December 160 orders for radioisotopes had been filled and research in various laboratories and clinics was well under way on a scale hitherto impossible. These orders represented sales amounting to $21,600, which is intended to cover the present cost of production.

Theoretically, the isotopes distributed could have been produced previously in cyclotrons—at a cost of several million dollars; they were not produced in such quantities both because of prohibitive cost and insuperable production difficulties. Most of the radioisotopes made in the chain-reacting pile, and some that cannot be made in the pile, may be produced in the cyclotron, a machine popularized as the "atom smasher." Yields from the cyclotron are extremely low, however, and each sample must be bombarded individually. In contrast, as many as 50 different samples in relatively vast quantities may be irradiated simultaneously in the chain-reacting pile.

Dr. Paul C. Aebersold, chief of the Isotopes Branch of the Manhattan District's Research

Division, points out that those isotopes which can be produced by slow-neutron irradiation can be obtained from the pile in quantities thousands and millions of times greater than from the cyclotron—although the physical quantity is still extremely small.

He cites carbon 14 as an example. To produce a millicurie of carbon 14 by normal cyclotron methods would require at least 5 efficient cyclotrons running continuously for a year at a final cost of about a million dollars. From the pile, hundreds of millicuries will readily become available. In the first four months of national distribution, the Manhattan Project supplied about 50 millicuries of carbon 14, which would have required about 250 years of cyclotron production on the basis mentioned previously.*

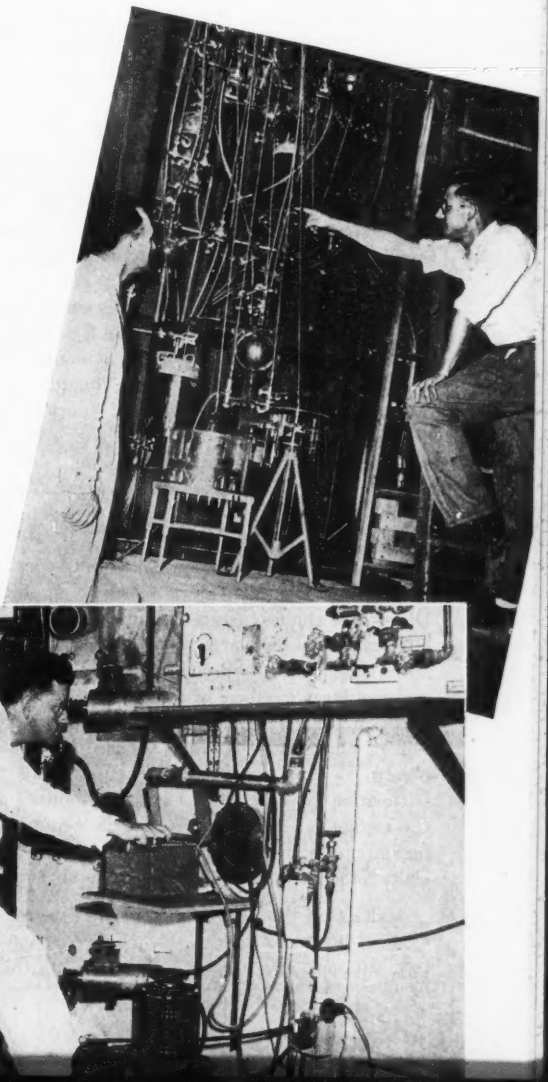
Thus, as a by-product of atomic bomb research, ample quantities of radioisotopes become available for full-scale investigations, at relatively low cost, in many laboratories that could not hitherto obtain them.

As pharmacists know, isotopes are species of atoms of the same element (same atomic number) that have nuclei of different weights. Different isotopes of a single element are usually identified by giving each a number, representing the atomic weight of the nucleus (e.g., hydrogen isotopes H-1 and H-2; uranium isotopes U-238 and U-235).

The nuclear weight of a radioisotope differs from that of stable isotopes of the element. (Chemically, stable and radioactive isotopes are indistinguishable.) A radioactive isotope is unstable. As a result of this instability of the nu-

* Although medicine and pharmacy turn to the chain-reacting pile as a copious source of most commonly used radioisotopes, the cyclotron retains its place as an important instrument of great versatility which is essential to many types of investigations.

THE ATOMIC PILE lies behind the shield shown on the facing page. Samples for irradiation are being loaded into a graphite bar, which will be pushed through the hole into the pile. Bombardment by neutrons from the chain reaction produces radioisotopes in the samples. When subsequent chemical separation of isotopes is necessary, work is conducted in the unique "hot laboratory." Chemists are shown (just below) installing apparatus in a closed cell for operations involving a high level of radiation. Apparatus is manipulated by remote control devices from outside the cell (bottom), where chemists view their work through periscopes.



cleus, it gives off alpha, beta or gamma radiations.

The characteristic radiations of a given isotope are emitted at an unchanging rate. This "death rate" is usually referred to in terms of "half-life": the point at which 50% of the material has yielded its radioactivity and become inert.

Some radioisotopes may be difficult to use in medical experimentation because the half-life, indicating the period of activity after production, is too brief for satisfactory work. If the half-life is too long, the rate of radiation may be insufficient to have significance in medical work, or radiation may be so prolonged in the animal body that the isotope is unsafe for use.

Nearly all of the radioisotopes now becoming available are produced in the pile at Oak Ridge. A few months ago the editor of THIS JOURNAL was given the opportunity to represent pharmacy among the first group of journalists permitted to observe operations in restricted buildings of the Manhattan Project.

Operation of the Pile

The chain-reacting pile of Oak Ridge lies behind a massive concrete shield. Its exact nature remains shrouded in secrecy, but the general principles upon which the production of isotopes depends have become well known.

Atomic energy in useful quantities comes only from a nuclear chain reaction. Like fire, this reaction is self-propagating. Only one material found in nature in appreciable quantities—uranium-235—has this property of "nuclear inflammability." At the dilution in which U-235 is found in naturally occurring uranium it can be burned only under very special circumstances achieved in a structure called a primary reactor or "pile."†

In the pile, slugs of uranium are interspersed through a moderator material, such as graphite. During the chain reaction uranium atoms break into fragments and large quantities of neutrons are released. As by-products of this fission of uranium large numbers of radioisotopes are produced in abundance—in addition to the production of plutonium that may be used in atomic bombs.

Isolation of individual isotopes produced in this fashion is difficult. Therefore most uranium-fission products being made available are specially produced by irradiating uranium, not by salvaging by-products from the plutonium process [*Science*, 103: 697, 1946].

Most of the radioisotopes in greatest demand for medical and biological investigations are obtained from a different source: irradiation of materials foreign to the pile.

Aluminum cans containing small amounts of such material are set into holes in a graphite block. When the graphite block is loaded with a number of samples, attendants push it into the center of the pile, as shown on page 6. For one to several weeks the material is bombarded by the storm of neutrons given off by chain-reacting uranium in the pile. Some of the neutrons penetrate the atomic nuclei of elements being irradiated, thus producing radioactive material. The period of irradiation depends upon the half-life of the desired isotope and other factors.

When it is time to remove the samples, attendants shut down the pile by inserting control rods that absorb the neutrons and thereby quench the "fire" of the chain reaction. (The control rods are also used to regulate the "burning" while the pile is in operation to prevent a runaway explosion.) When the hole in the pile is opened, the graphite block studded with the aluminum cans (which now contain radioisotopes), is withdrawn into a lead "coffin." This and other elaborate precautions are necessary because of dangerous radiations being emitted from the samples, the cans themselves, and because of residual radiations from the opened pile.

During the opening and closing of the pile, and wherever radioactive materials are processed thereafter, Geiger counters continually check the atmosphere for hazardous amounts of radiation.

Many of the cans may be shipped to investigators just as they are removed from the pile, except for packing in containers which stop harmful radiation. Such radioisotopes, which require no subsequent chemical processing, are called "non-processed irradiations." Those that do not involve transmutation from one element to another (e.g., P-32 from P-31 and S-35 from S-34) are ordinarily in this category.

Chemical Separation

In the case of transmutation of elements (e.g., C-14 whose parent is N-14) the chemical difference between the radioisotope and what is left of the parent substance permits separation.

Fission of uranium produces isotopes of many species (e.g., Ba, I, Ce, etc.). This involves not only removal of the mixed radioactive species

† See "A First Report on the Scientific and Technical Aspects of the Problem of Control" by the Scientific and Technical Committee of the UN Atomic Energy Commission.

from the parent uranium but also the separation of each radioisotope from others in the radioactive mixture.

Despite the history-making significance of the chain-reacting pile, the remarkable equipment and techniques used in laboratories for the chemical separations are perhaps of most interest to a pi... acist who has the privilege of observing operations at the Oak Ridge facilities. These developments of the atomic age have been called by Allison "a veritable rebirth of inorganic chemistry."

In the "Hot Laboratory"

In the so-called "hot laboratory," where radioactive material is processed, the chemist must be protected from dangerous radiations either by distance or by shields of lead or concrete. Since the need for close observation is comparable to that in an ordinary laboratory, the use of shields is usually preferable to the protection of space. To remain shielded and still see what he is doing, the operator employs periscopes and reflecting mirrors to permit vision around corners. Specially designed tongs and other devices permit him to handle apparatus from behind the shield.

These complications reach their peak when relatively large quantities of radioactive material must be extracted. For this purpose the operator uses a small room, or "cell," entirely enclosed by concrete walls about two feet thick. The apparatus for extraction is placed inside this room with all controls on the outside where the operator and the eye-pieces of the periscopes are located. By means of air-pressure devices, vacuum processes, electrical apparatus, rods and grappling devices the operator puts the radioactive material through the necessary physical and chemical steps by remote control (see illustrations, page 7).

Because the mass of a pure radioisotope is very small in relation to its activity, the chemist frequently works with amounts which would be invisible in crystalline form. Instruments are built into certain parts of the apparatus to indicate how much radioactive material is at a given point at any time. Electronic radiation-measuring instruments are to the radio-chemist what the balance is to the analytic chemist or pharmacist, and what the microscope is to the bacteriologist.

The final product from a radio-chemical separation is supplied as an aqueous solution of the radioisotope. The strength of radioactive materials customarily has been expressed in curies and fractions thereof, such as millicuries and microcuries. As defined by the Manhattan Project a curie represents 3.7×10^{10} disintegrations per second. Some authorities consider this an erroneous use of the term "curie," and recommend the adoption of a different system of unitage [*Science*, 103:712, 1946].

About 450 radioactive forms of natural elements are known, and most of the important ones can be produced from the chain reaction. Small amounts of about 50 of these have already been distributed by the Manhattan Project to qualified applicants, Dr. S. K. Allison, director of the University of Chicago's Institute for Nuclear Physics, indicated at the atomic energy forum held by the American Pharmaceutical Manufacturers Association at its meeting in December. On the same forum panel, Dr. Paul C. Aebersold, chief of the Manhattan District's Isotopes Branch, pointed out that most of the radioisotopes distributed were known and used before the war, as products of the cyclotron. Many valuable research reports were subsequently published on such work. The significance of postwar developments thus lies in the general availability of radioisotopes to qualified workers, and in the introduction of new isotopes and new techniques.

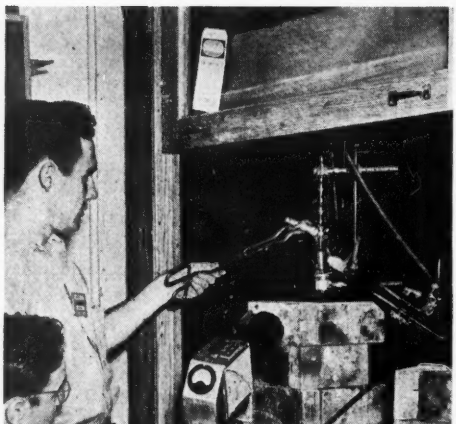
Fortunately, the pile can produce on a great scale most of the radioisotopes of importance in biological investigations. Aebersold cites as examples: H-3, C-14, Na-24, P-32, S-35, Cl-36, K-42, Ca-45, Fe-55, Fe-59, Cu-64, Zn-65, Br-82, Sr-89 and I-131.

Uses in Pharmacy

Uses of radioisotopes having special interest to the pharmacist fall into two broad categories: (1) The tracer technique, employing a compound which has been "labeled" by introducing a radioactive atom into its chemical structure. Such atoms may be traced, by instruments sensitive to the radiations emitted, through a labyrinth of biological reactions and processes. (2) Therapeutic treatment aimed at local irradiation of pathologic tissue by administration of radioisotopes.

Most research progress in the use of radioisotopes, at least for the immediate future, undoubtedly will come from tracer experiments. Except in a few instances, the direct therapeutic application of radioisotopes appears to involve problems that will take time and concentrated effort to solve.

Tracer techniques can and will be applied to many problems in the field of pharmacy. At the Purdue University School of Pharmacy, for ex-



CHEMICAL PROCESSING may be conducted behind a lead shield under the hood, as shown above, when radioisotope solutions have a relatively low level of radiation that does not require the closed-cell technique. An assistant checks the air near the hood with a Geiger counter to make certain that the chemist is not exposed to dangerous radiation.

ample, researchers have been working for more than two years with radioisotopes prepared in a cyclotron.

At the time the writer visited the atomic laboratories at Oak Ridge, a sample of phosphorus was being irradiated in the pile for Dr. John E. Christian and his associates at the Purdue School of Pharmacy. It is of interest to note that this represented one of the first shipments of radioisotopes from the pile under the initial distribution plan.

In a personal communication, Dr. Christian writes:

"Many of our experiments have involved the use of radioactive sodium chloride as well as radioactive phosphorus. During the past two years radioisotopes have been rather difficult to obtain, but now that the supply has become more plentiful through the Oak Ridge pile, we are prepared to take advantage of this increase in supply to further our research aims.

"The over-all objective at this time is to develop new techniques which may be applicable to the administration and testing of medicinal products. Experiments with radioisotopes concerning the effect of various substances on the absorption by the normal skin, mucous membranes and other tissues of the animal body are being carried out. New techniques are involved in this work, and the application of such techniques opens a vast and important field of pharmaceutical research.

"Additional experiments involve tracer studies of the mineral metabolism of the body parts and the effect of various substances upon the mineral content of these body parts. Still another application of tracer elements in our work at Purdue has been the development of a new method for the study of irritating residues on the skin.

"Our work currently involves the development of these new techniques—not clinical applications, although it is apparent that this phase of the problems will soon be included in our plans."

In these and other tracer experiments radioactive material is employed in too small an amount to induce abnormal changes in tissue cells. Instead, the molecules tagged with a radioisotope play their normal role in physiologic processes. By tracing the course of these molecules step by step, little-understood body mechanisms may be elucidated.

At the A. P. M. A. atomic energy forum, Dr Aebersold commented: "No group should be quicker to awaken to the new opportunities afforded by radioisotope 'tracer techniques' than the pharmaceutical profession. Many of the most complex problems of drug manufacture and drug action can be ideally attacked with tracer techniques; in fact many will be soluble practically by no other means."

The degree of sensitivity which may be achieved in tracer experiments is difficult to grasp. For example, as little as a billion billionth (10^{-18}) of a gram can frequently be detected.

The specificity of the tracer technique is greater than by any other method. For example, calcium atoms in a glass of milk "labeled" with radioactivity can be distinguished in the body from unlabeled calcium atoms ingested in a second glass of milk.

Aebersold further points out that the complexity of the processes traceable with radioisotopes is almost unlimited. For example, a particular carbon atom in a complicated molecular structure may be labeled; if, in an organic process, this atom shifts to another position in the

molecule, the nature of the change may be revealed by tracer techniques.

These qualities of radioisotope tracers—great specificity, sensitivity, and ability to unravel complex processes—are particularly adapted to the study of pharmaceutical problems.

Aebersold indicates some of the possibilities: "Although radioisotopes are especially appropriate for tracing the history of a pharmaceutical agent itself (its synthesis, absorption, excretion, alteration, breakdown, etc.) they may also be extremely useful in studying the physiological changes induced by it. Studies may be made by means of radioisotopes of the metabolism—with and without the influence of the agent—of a wide variety of elements and compounds in various organs and tissues. One would observe the effect of a certain drug on the rate of turnover and excretion of certain essential minerals or organic compounds. . .

"Of even more importance, but perhaps not as direct an application to pharmacology as tracing pharmaceutical action or studying physiological changes induced by pharmaceuticals, is the great wealth of fundamental knowledge that will be gained in the physiology and biochemistry of the body in both normal and abnormal conditions. By learning what is going on biochemically in organs and tissues under all kinds of conditions, new pharmaceutical approaches to medical problems will inevitably develop."

Startling Vistas

Other authorities have concurred with Aebersold's view. Startling vistas of research are now open in pharmacy. Incorporation of radioisotopes in vitamins, hormones and other drugs will reveal information concerning their mechanism of action and fate in the body that has hitherto been unobtainable.

To utilize radioisotopes now available for such studies involves the related project of preparing complex organic drugs in radioactive form. At the A. P. M. A. atomic energy forum, Allison made an interesting proposal for meeting this need: "The setting up of a center for the manufacture and stockpiling of such drugs is a matter with which the pharmaceutical societies could well concern themselves. The lack of such a center is at present a bottleneck to progress in this field.

"For certain organics, such as serums, opiates, dyes, etc., it may be best simply to use animals or plants as the synthesizing agents. Farms may be operated in which the fertilizers and foods will be radioactive, so that radioactive antitetanus serum can be obtained from radioactive horses, and radioactive opium from active poppies. Radioactive bacteria may also be produced."

Aebersold concurred in the view that there is need for some agency to supply radioisotope-labeled compounds, foreseeing "an opportunity for agencies to furnish such compounds on a production volume similar to that of supplying rare chemicals and special organic compounds." The present practice of each research group performing its own syntheses of tracer material is considered a duplication and waste of research effort.

Therapeutic Prospects

With regard to direct therapeutic use of radioisotopes, the predictable demand for radioactive material also falls far short of a large-scale pharmaceutical enterprise. But if future research should yield the much-sought compounds that will selectively localize in various malignant tissues and deliver a nontoxic therapeutic dose of radiation, the demand for such a drug or drugs would obviously be great. It has been pointed out, however, that only 1 Gm. of I-131 atoms represents an activity of about 100,000 curies, or enough to treat 10,000,000 or more cases of hyperthyroidism. Such potency is not easily comprehended by the pharmacist, or physician, trained in the pre-atomic age!

Indications for the therapeutic use of radioisotopes are extremely limited at the present time, despite some over-optimistic press reports. Future possibilities are intriguing but uncertain.

Radioisotopes of iodine and phosphorus have been most widely used, and are perhaps the only ones which may be considered of proved value. Dr. C. P. Rhoads* recently reviewed the medical uses of atomic energy in a talk given before the Scientific and Technical Committee of the UN Atomic Energy Commission.

Rhoads pointed out that radioactive forms of each of the two elements, phosphorus and iodine, have been shown to be useful in treating one noncancerous disease and one form of cancer.

Recent reports confirm prewar investigations indicating that the administration of radioactive iodine can control hyperthyroidism effectively. Rhoads estimates that control can thus be

* Director of the Sloan-Kettering Institute for Cancer Research, director of the Memorial Hospital and chairman of the Committee on Growth, National Research Council.

achieved in about 80% of the patients. Although there is still some difference of opinion concerning the proper dose, duration of control, and limits of safety, it is agreed that this represents an important therapeutic achievement with the use of radioisotopes.

The use of radioactive iodine to treat thyroid cancer has proved much more difficult, although there have been dramatic results in a few cases. A principal difficulty is the wide range of affinity of cancerous thyroid tissue for iodine. Apparently, as cancer cells become more unlike their parent thyroid cells—that is, more malignant—they lose, to an increasing degree, the ability of thyroid tissue to pick up iodine from the blood stream.

Rhoads estimates that "not more than 15% of all thyroid cancers, a rare disease in the first place, has been shown to pick up appreciable amounts of radioactive iodine." He holds little hope that elemental iodine in radioactive form will provide effective treatment in a very large percentage of thyroid cancers. Undoubtedly there will be efforts to find an organic compound, into which radioactive iodine has been incorporated, that will be picked up in adequate amounts by cancerous tissue.

In the case of radioactive phosphorus, much attention has been given to the treatment of leukemia, a cancer of the blood-forming tissues. Cancer cells in the various types of blood-forming tissue pick up more phosphorus than normal cells, thus offering the hope of localized radiation therapy.

Radioactive Phosphorus

Rhoads reports that radioactive phosphorus has been used to treat some 150 patients with myelogenous leukemia—the type involving the defensive white-blood cells formed in the bone marrow. In summarizing over-all results it was stated that "rather uniformly the growth of the cancer cells can be restrained to some extent, the symptoms of the patient can be lessened, but life probably is not prolonged."

In lymphatic leukemia, a type which frequently affects children, the results are even less promising. About 160 patients were studied in various clinics. Referring to the treatment of those with acute lymphatic leukemia, Rhoads said "there is no good result whatever and it is distinctly hazardous." Of the patients with chronic lymphatic anemia, only about 50% showed any measurable benefit from radioisotope therapy. Clinical improvement appears to be transient, with no prolongation of life.

The hazard in treatment arises from the fact that normal tissue picks up radioactive phosphorus nearly as well as pathologic tissue; and the exact sensitivity of normal tissue to radiation cannot be predicted. Future use of the treatment appears to depend upon development of new compounds of radioactive phosphorus that may permit selective deposition in cancerous tissue.

"Excellent" for Polycythemia

In contrast, Rhoads pointed out that radioactive phosphorus may be considered "an excellent therapeutic agent" for the treatment of polycythemia, a disease characterized by abnormally rapid formation of red blood cells. Doses in the range of 2 to 4 millicuries result in the disappearance of symptoms, which lasts up to two years or more without further treatment.

To summarize, it appears that radioisotopes are tentatively established as useful medication for hyperthyroidism and polycythemia, both noncancerous diseases. Their use, in currently available forms, remains highly questionable for thyroid cancer and cancer of blood-forming tissues.

These very limited successes may be expected to accelerate rather than discourage research with radioisotopes in the field of therapy. Investigators are already beginning to study the vast variety of organic compounds that may be synthesized to contain radioisotopes. Some of these, it is hoped, will be deposited more selectively in cancerous tissue.

Rhoads cites two examples of this approach which are now under way. Attempts are being made to synthesize amino acids containing radioactive elements, in the belief that cancer tissue contains somewhat different proportions of amino acids than normal tissue. The hope is that cancer tissue will show a greater affinity for such compounds. With a similar objective, experiments have been initiated to synthesize sex hormones containing radioactive elements. Cancer occurs frequently in organs under the control of sex hormones, and in such cases radioactive hormones possibly might be concentrated sufficiently in the affected organs to produce a therapeutic effect.

Regardless of the form of radioisotopes or the method of administration, physiologic effects are produced by ionization of protoplasm. The chemical products from tissue ionization and their mode of action are not well understood. At the A. P. M. A. atomic energy forum, Dr. Shields Warren, pathologist associated with the Harvard

Medical School, speculated that ionization is probably effective through disruption of enzyme systems. Cells may be injured by damage to a vital portion of the nucleus, by chromosomal alterations (producing abnormalities in descendants of the cell), and by alteration of cellular function.

Although it should be fully recognized that there are no prospects of radioactive isotopes being available on prescription, their importance to pharmacy in its broad aspects would be difficult to overemphasize. The most important use of such substances, at least in the immediate future, lies in the field of tracer techniques—the value of which manufacturing pharmacy will undoubtedly be quick to recognize in research activities. One may also forsee the time when radioactive compounds will appear in the U. S. P. or N. F.

As the medical aspects of the atomic age unfold, pharmacists will be in a strategic position to guard the public against unwarranted hopes concerning treatment and the always present danger of exploitation of this field by charlatans. Controlling the distribution of radioactive preparations will present regulatory problems of great importance, as their availability increases.

Radioactive compounds have an extremely high toxicity when improperly used. Death in such cases comes in slow and painful form. Treatment of "radiation sickness" remains entirely inadequate, offering another problem in this field to which pharmaceutical laboratories may direct research efforts.

At the time of exposure to toxic doses of radiation the victim has no warning or sensation of injury. Effects are frequently long delayed, and in the case of injury to chromosomes may become apparent only in subsequent generations.

Present knowledge and adequate instrumentation can avoid harmful effects, however, in the hands of competent personnel. Some of these techniques are similar to those developed for handling radium. Although radioisotope techniques are not very difficult to learn, according to Aebersold, investigations in many laboratories must necessarily be delayed until scientific personnel have obtained the requisite specialized training. It is expected that some institutions will be offering courses in this field.

For obvious reasons the distribution of radioisotopes from the chain-reacting pile is limited to accredited institutions or organizations for specific uses by skilled workers. An elaborate interim mechanism for allocation and distribution has been operated by the Manhattan District, Corps of Engineers. Responsibility for continuation of the isotope distribution program has, since January 1, 1947, been taken over by the Atomic Energy Commission. Requests for material are initiated through the Isotopes Branch, Research Division, Atomic Energy Commission, P. O. Box E., Oak Ridge, Tenn. Final decisions on extension of the isotope program and on development of various medical aspects of atomic energy now rest with the five-man national Atomic Energy Commission.

CYTOCHROME C MAY AID ANOXIA STATES

Cytochrome C, a protein normally present in all living tissue, may be injected to combat tissue anoxia. Using beef heart as the source of cytochrome C, a stable and apparently nontoxic preparation can be made by reprecipitation and passage through a Seitz filter.

Noting an increase of 50 to 100% oxygen consumption *in vitro*, Drs. Samuel Proger and D. Dekaneas of Tufts Medical College and the Pratt Diagnostic Hospital, Boston, believe that conditions in which anoxia is thought to play a role might be benefited by the injection of cytochrome C. Since there is considerable unused oxygen in venous blood even in severe cases of anoxia, the role of cytochrome C is to promote utilization of the oxygen by tissues. The fate of this injected protein substance in the body is not clear but it is assumed to be broken down before excretion. If further studies continue to show cytochrome C to be nontoxic in unlimited doses, a single large injection may be used to serve as a supply for several days or longer.

Preliminary observations using cytochrome C have been made in Raynaud's disease, pulmonary emphysema, hemorrhagic shock, and certain cerebral dysfunctions. Future studies will be carried out to determine its value in those degenerative diseases associated with arteriosclerosis in which mild anoxia may be a factor.

—*Science 104: 389 (October 25) 1946.*

A PROGRESS REP[O]M FIEL

1946 Ac

Many pharmacist-veterans did not return to practice, for they gave their lives for our way of life. Plans were announced for a memorial flagstaff on the grounds of the A. PH. A. building in Washington, dedicated to these and other pharmacists who have served their country in time of war.

IN 1946 radioisotopes for constructive medical research became generally available from the atomic pile which previously had unleashed the destructiveness of the atomic bomb. Streptomycin was distributed through pharmacists for the first time, taking its place alongside penicillin after millions of dollars had been poured into developmental research and production techniques. Thiouracil and influenza virus vaccine were among other important drugs introduced.

At year's end the AMERICAN PHARMACEUTICAL ASSOCIATION had issued National Formulary VIII, and U. S. Pharmacopœia XIII was expected early in 1947. Both compendia reflected rapid changes in therapy which represent the greatest advance in history along the frontiers of pharmacy and medicine.

Membership in the AMERICAN PHARMACEUTICAL ASSOCIATION soared well past the 12,000 mark as 1946 drew to a close, bringing new plans for further expansion of the ASSOCIATION'S services.

Although the pharmacist's volume of professional service reached a new high, the profession was beset by doubts and problems. To set up guideposts for the future, a nationwide study of the profession got under way, conducted by the American Council on Education. Indications were that impartial reports of the Pharmaceutical Survey—possibly forthcoming in 1947—might go far toward clarifying the profession's future objectives.

Many pharmacist-veterans returned to practice, somewhat easing the pressure of personnel shortages. Further relief was on the way as pharmacy college enrollments shot past the 15,000 mark. Indeed pharmacists were already looking ahead with some apprehension concerning the effects of any sustained influx of practitioners on this scale.

Announcement of the synthesis of penicillin came late in 1946, carrying implications of far-reaching importance in pharmaceutical and medical research. Although application of penicillin synthesis to large-scale production was not yet in sight, studies of the reaction showed that hitherto unknown types of penicillin may be produced and opened other avenues for scientific exploration.

Further reports on the chemistry of penicillin were promised, including data that had been under security restrictions during the war years. Additional wartime research achievements were revealed for the first time during the year. The highlights of 1946 in pharmacy and medicine, and in several other scientific fields of special interest, are summarized on following pages from Science Service reports and in part from the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

MEDICINE AND PHARMACY

World Health Organization was formed under United Nations auspices, with pharmacy's Robert P. Fischelis, the A. PH. A. secretary, serving as an adviser to the U. S. delegation.

New antimalaria drugs include pentaquine, or SN 13,276, believed a positive cure; and aralen, or SN 7618, manufactured commercially and declared better than atabrine and quinine.

Synthesis of benzylpenicillin (G) was announced, and the reaction employed was used to produce hitherto unknown types of penicillin. Commercial applications remained in the future.

Vitamin A, usually obtained from fish liver oils, was successfully synthesized. Two vitamin E chemicals were discovered as effective aids in protecting vitamin A in fish liver oils from oxidation on exposure to air.

Science in Review

First nation-wide test of the use of streptomycin in treating tuberculosis was begun.

New conquests by streptomycin included: cure for tularemia; improvement of typhoid fever patients; recovery for many cases of urinary tract infections, influenzal meningitis, blood poisoning, lung infections, undulant fever, salmonella infections, peritonitis, and Shigella dysenteries.

The new drug, dihydrostreptomycin, was found to be as active against bacteria as streptomycin, from which it is derived, and also more stable.

Penicillin saved 11 persons from agranulocytosis; 25 patients with skin anthrax recovered when treated with the drug; and penicillin was found to be the best treatment for mastitis, most prevalent dairy cattle disease.

A new antibiotic, erythrin, extracted from the erythrocytes of rabbits and other animals, was announced as a promising remedy in diphtheria and other infections.

Preparation of vaccines for protection against parrot fever and rabbit fever were announced.

Nitrogen mustard gases, formerly used as war chemicals, were tested as possible remedies for some kinds of cancer and cancer-like diseases; patients with Hodgkins' disease temporarily improved after treatment.

Protection against cyanide gas was found in an analgesic agent, para-aminopropiophenone (PAPP).

Ex-war-gas chemical, di-isopropyl fluorophosphate, was used to treat glaucoma and myasthenia gravis.

Explosive nature of wounding from high-velocity missiles was recorded by an ultra-high-speed motion picture camera and a microsecond X-ray apparatus; miniature "earthquake" waves caused by the striking bullet were found to break bones not actually hit, damage a wide area of tissues and cause a general shock.

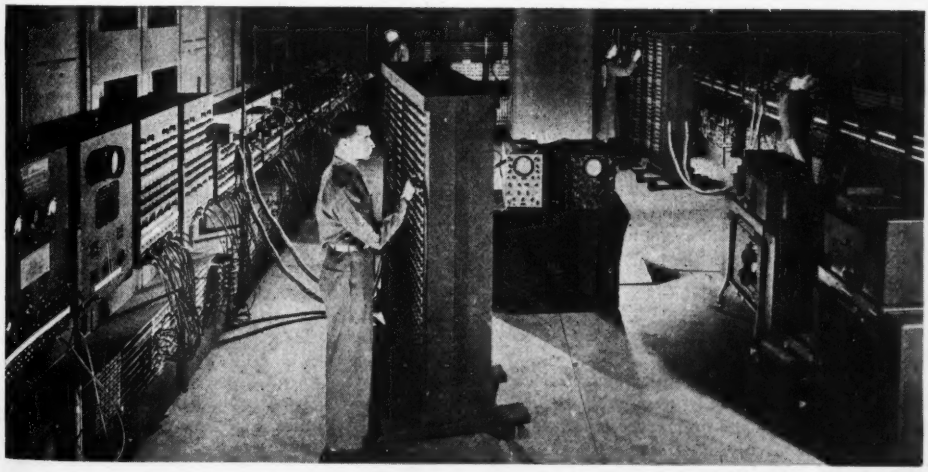
Hydrocephalus, or "water on the brain," may be due to the mother's diet being deficient in some substance contained in liver, research showed.

An electronic reading aid which converts printed letters into distinctive sounds was developed for blind readers.

Biggest infantile paralysis epidemic since 1916 struck the United States with reported cases totalling above 24,000.

Tridione was successfully used to treat petit mal epilepsy.

Ether injections intravenously were found effective in relieving painful ischemia in diabetes, Buerger's and Raynaud's disease and in preventing gangrene.



MOST INTRICATE ELECTRONIC DEVICE in the world, a general-purpose computer (shown above), calculates 1000 times faster than the best general-purpose machine previously built. Developed at the University of Pennsylvania, the computer contains about 18,000 electronic tubes.

Some quality of the surface of lung tissue and of other tissue was found to allow white blood cells and other scavenger cells of the body to destroy pneumococci without the aid of special antibodies.

Transformation of pneumococci from one type to another was accomplished by use of desoxyribonucleic acid.

Injections of cytochrome C, a chemical normally present in all living tissues where it functions in oxygen utilization, relieved patients with angina pectoris and raised hope of giving relief in artery hardening, certain mental disorders and other conditions due to insufficient oxygen.

Denuding the cornea of its outer layer—with fluorescein used to tell when the operation is necessary—was announced as successsful treatment for eyes burned by chemicals.

The first mumps vaccine, in the final stages of development, proved successful in immunizing monkeys.

Ringworm scalp infections in children were cured with salicylanilide or copper undecylenate.

The Anopheles crucians mosquito, active throughout the southern states, was discovered as a new carrier of malaria.

Blood transfusions and penicillin were found to be the best means for combating after-effects of exposure to atomic radiations. Liver extract, iron compounds, chemicals derived from the blood's hemoglobin, and folic acid were tested as possible remedies for atom bomb victims.

Regular doses of benadryl were found to relieve sufferers of hayfever and hives.

Diagnosis of breast cancer with radioactive phosphorus provided a means of detecting malignant tissues in need of surgery.

Hemophilia victims, treated with globulin and thrombin from blood plasma, survived operations without hemorrhages.

Bacteriophage in sugar solution administered to patients intravenously cut typhoid fever death rate 50% in clinical trials.

Two types of skin cancer were successfully treated with radioactive phosphorus, an atomic research by-product.

Atomic "tracer" research to determine the safe level of carbon monoxide in airplane cockpits proved that the gas cannot combine with oxygen to form carbon dioxide in the human body.

A seeing-eye cane for the blind that detects the distance and direction of obstacles within 20 feet by a radar-like beam of light was developed to the testing stage.

One of the B vitamins, para-aminobenzoic acid, or PABA, was successfully used to treat typhus fever and Rocky Mountain spotted fever.

Babies stricken with infantile diarrhea recovered when treated with lysozyme, a chemical found in saliva, tears and most body fluids.

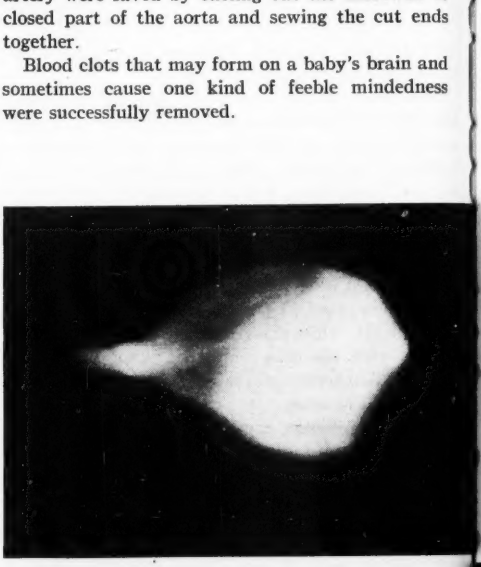
Raw fish and clams were found to inactivate vitamin B_1 from other foods, changing it into a different compound that has no vitamin value to mammals

Experiments with rats indicated that lack of milk in the daily diet may possibly influence the development of cancer of the liver.

Success with vitamin E treatment of purpura, rare hemorrhagic disease, was reported.

Children born with a defect of the body's main artery were saved by cutting out the narrowed or closed part of the aorta and sewing the cut ends together.

Blood clots that may form on a baby's brain and sometimes cause one kind of feeble mindedness were successfully removed.



SELF-PORTRAIT—A small dead fish, netted in Bikini lagoon after the atomic explosion, was so radioactive it took its own photograph (above) when placed on a photographic film.

A nerve cutting operation brought relief of pain to many sufferers from stomach ulcers.

Furacin, a nitrofuran, was introduced as a new chemical agent for infections.

An outbreak of Q fever was reported as occurring among stockhandlers in Amarillo, Texas.

Rickettsialpox, a new disease, and its cause, a rickettsia, were discovered.

Severe bleeding during brain tumor operations was controlled by drawing blood from the patient's artery to a reservoir, thus reducing blood pressure and bleeding, and returning blood to the artery after operation.

Cure of a case of Addison's disease by graft of the adrenal gland from a patient with overactive adrenals was reported.

Muscle strips from abdomen and legs were successfully grafted on heart muscles of dogs, suggesting that similar surgery might be practiced for some human heart disease victims.

A new memorial laboratory planned to provide maximum safety for research workers studying in-

fectious diseases was opened at the National Institute of Health.

A special breathing chamber devised for keeping the lungs at rest was tried with promising results in the treatment of pulmonary tuberculosis.

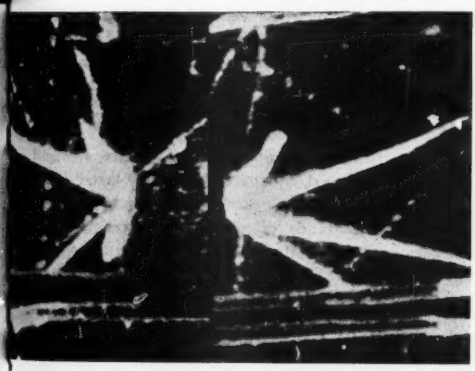
Folic acid and thymonucleic acid were found effective in the treatment of the macrocytic anemia of sprue and pernicious anemia.

Three new drugs, carbarsone oxide and two sulfur-containing arsenicals, showed promise for control of chronic amebiasis.

Ferric and ferrous forms of iron when fed to rats in large amounts may be effective in combating lead poisoning, rat experiments showed.

Poisoning by ethylene dichloride and propylene dichloride can be combated, in rats at least, by

ATOM SMASHING in nature was revealed in photographs taken atop Mount Evans, Colo. Disintegration of a nucleus (shown below from two angles) caught on a photographic plate was apparently caused by a neutron in a cosmic ray. Each large point of the star-effect represents an alpha particle. It is assumed that neutrons, which cannot be photographed, are being emitted in the direction away from the alpha particles.



feeding the amino acids, cystine and methionine.

A method using special emulsions for the registration of alpha particle tracks was applied to the classification of uranium and thorium minerals and to the localization of polonium in animal tissue and resulted in the discovery of radiocolloid aggregates in pitchblendes.

The metal shadowing technique for microscopy was used to observe submicroscopic antigenic material from epidemic typhus vaccine, to study directly the surface structure of living teeth and to photograph directly with the electron microscope the molecular arrangement in single virus protein crystals.

The Nobel prize in medicine and physiology was awarded to Prof. Hermann Joseph Muller, Indiana University, for his discovery of the genetic effects of X-rays; half of the award in chemistry was given to Dr. J. B. Sumner, Cornell University, pioneer crystallizer of enzymes; half was awarded jointly to two scientists of the Rockefeller Institute for Medical Research, Dr. W. M. Stanley for researches on viruses and Dr. J. H. Northrop for work on enzymes and viruses.

Improved procedures were reported to conduct the rabbit test for pyrogens in injectable drugs.

Crystalline penicillin became generally available, and scientists uncovered new knowledge of penicillin's chemistry, assay procedures, therapeutic actions and fate in the body.

Improved chemical debridement of burns was promised by extensive studies of wettable powder formulations used to produce acid-containing ointments.

New studies were reported on the formulation of penicillin ointments and creams, and an improved technique was developed for evaluating their activity.

Chemical relatives of DDT promised to have some advantages over the original compound, including lower toxicity for fish.

The value of folic acid in the nutritional anemias was confirmed, and synthesis of this member of the B-complex was announced.

PSYCHOLOGY AND PSYCHIATRY

Congress passed the National Mental Health Act, marking the first time in history that any nation recognized mental health as a serious problem worthy of the attention and money of its government.

Sodium amytal, psychotherapy and retraining helped speed the recovery of veterans who through brain injuries lost the ability to speak, read, write, or understand language (aphasia).

Students' chances of making good in college were predicted by the Rorschach ink-blot test, which was also found useful in warning when a person is reaching the state of mind in which he is likely to commit murder or suicide.

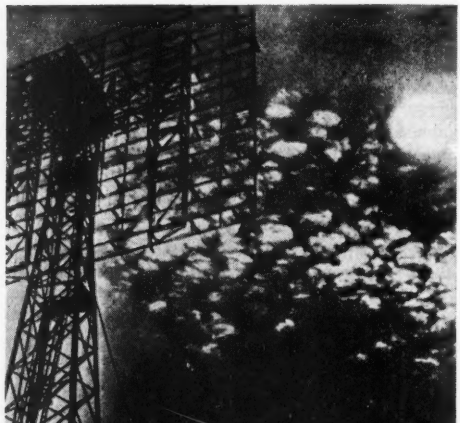
Problem children with abnormal brain waves were made to behave better in certain cases by the administration of dilantin.

Hang-overs were found to be the most effective periods for psychological treatment of alcoholics.

Lactic acid, adrenalin, and medically induced delirium were successfully used in treating, respectively, depressions, anxiety states and borderline psychiatric disorders.

Finger-painting was used to diagnose and treat two mental diseases, schizophrenia and paranoia.

Extreme race haters are on the verge of mental imbalance, blaming a racial group for their own shortcomings, it was shown by questionnaires and psychological tests.



FIRST CONTACT WITH THE MOON was achieved by Army Signal Corps scientists, using specially designed radar. Very high frequency waves were shot into space from the antenna shown above. The echoes were detected seconds later after a round trip of about 477,714 miles.

Children suffering from schizophrenia, were found to have a better chance of getting well when treated at the physician's office than when sent to a mental hospital.

Prevention of schizophrenia in some cases by removal of frustrations was declared possible on the basis of studies in which removal of frustration brought recovery, while reintroduction of the frustrating situation brought recurrence of the illness.

Aches, pains, fatigue and lack of energy may come from emotions and attitudes frequently aroused by marital or work difficulties, studies of patients showed.

Middle-class children are more often made neurotic by the conflict between submissive and aggressive drives than are lower-class children, studies showed.

Glutamic acid administered to mentally deficient patients raised the I. Q. in certain types of cases.

Army experiences with mental breakdowns indicated that successful treatment depends upon finding and changing the cause of unbearable stress.

Feeblemindedness tends to be sporadic and not greatly associated with family feeblemindedness, while schizophrenia may occur in families of at least half the patients with this mental disease, studies of the heredity of mental disease showed.

Many accidents are caused by personality difficulties of the injured, with depression, over-excitement, drunkenness, anxiety, fear or anger as contributing emotional causes, accident studies indicated.

Noise was found in tests with intense airplane noises to have little effect on most types of mental, motor and psychological activity.

BIOLOGICAL SCIENCES

Biological warfare research brought such peacetime benefits as vaccines against the cattle plague, rinderpest, two highly fatal poultry maladies, Newcastle disease and fowl plague, psittacosis and tularemia; and an improved toxoid to fight botulinus poisoning in food.

Botulinus toxin, so powerful that one ounce could wipe out almost the entire population of the Americas, was announced as developed in biological warfare preparations.

Wartime development of plant-killing chemicals that could have been used in attacking enemy crops was disclosed.

Several powerful insecticides revealed include insect-killer NMRI-448, effective up to 30 hours after spraying; mosquito-repellent 612; benzene hexachloride, against cotton insects; 666 against parasitic ascarid worms; velsicol 1068; and DPE, TDE, and DFDT, all chemical relatives of DDT.

New penicillin-like antibiotics discovered include colistatin and litmocidin, produced by a soil organism; a chemical produced by an organism found in human saliva; two compounds from wild ginger and one from dead and decaying leaves; and clavacin, produced by an organism isolated from manure.

Female sex glands of white mice were successfully transplanted into the bodies of white rats in the first ovarian transplantation from a different species; ovaries were successfully transplanted from one female dog to another of different breed.

Unborn embryo mice, in an experiment expected to aid cancer research, were enabled to produce living offspring through the transplantation of their still-immature ovaries into the bodies of other female mice.

Proteinogen, mother substance of all proteins, was discovered.

Rearranging the DDT molecule produced a variety of DDT that kills the larvae of malaria-bearing mosquitoes, but is ineffective against adult mosquitoes, house flies and body lice.

Fungi and viruses that cause disease in plants were grown for the first time on masses of plant tissue fed on a chemical solution.

Treating parent spores with mustard gas produced 29 new physiological varieties of a fungus.

Giant lilies of lasting beauty were produced by

the use of the "evolution-drug," colchicine.

Excess of manganese in acid orchard soil was found responsible for a disease that produces dead areas on the inner bark of apple trees.

Sulfonamides were used to save young trout and salmon from furunculosis, destructive hatchery disease.

Methoxone, a weed-killing chemical related to 2,4-D, increased the yield of wheat in field tests.

"Tristeza," a disease that attacks grafted citrus fruit trees, was described from South America, where it has already destroyed at least half of the fruit trees in the principal citrus area.

Research was begun to adapt bacterial warfare for combat against insect pests.

A vaccine that prevents distemper in dogs was used successfully as a cure for the disease.

Birds were kept from eating rodent pest baits by dyeing the poisoned grain either bright green or yellow.

Motherless male insects were produced from eggs heavily treated with ultraviolet radiation and fertilized with untreated sperm.

Carbon dioxide was found to be the best anesthetic for surgical work on insects.

The world's largest soilless gardens, where vegetables can be raised in gravel beds on water solutions of fertilizer chemicals, were under construction for occupation forces in Japan.

CHEMISTRY AND PHYSICS

An electronic computing machine, containing 18,000 electronic tubes and capable of adding numbers in 1/5000 of a second, was devised to speed solution of mathematical equations; a desk-sized mechanical "brain" was designed to solve linear algebraic equations.

The magnifying power of an electron microscope was doubled by an improved magnetic lens that made it possible to distinguish particles separated by only 50 billionths of an inch.

Production of radioactive isotopes yielded chemical elements 43, 61, 85, and 87, thus closing the last gaps in the chemical table and showed that the elements previously reported for these numbers, masurium, illinium, virginium and alabamine were errors and must be replaced.

Infrared equipment—in which invisible heat waves are converted into visible images—was revealed as used in communication systems and Army night-seeing snooperscopes.

Use of cesium metal vapor as a wave generator in an electric lamp improved infrared communication systems. These permit conversation within a ten-mile range without use of wires or radio.

Dry-ice fragments against a cloud of supercooled droplets in a laboratory cold-chamber formed ice crystals that fell like snow; the process may be useful in clearing dangerous supercooled clouds over airfields.

Nitromethane, an explosive more powerful than TNT but much safer to handle, was made by combining nitric acid and natural gas.

Lactic acid and acetic acid were produced cheaply from pulp mill waste.

Synthesis of sucrose from simpler compounds by a process using phosphorus, led to the creation of two sugars not found in nature.

Explanation of the way in which two electron particles get together by passing between them a bundle of light, called a photon, opened the way for understanding atomic nuclei and cosmic rays.

Cosmic ray showers are 300 times more numerous in the upper atmosphere than at ground level, and the peak concentration of the mesotron particles generated by cosmic rays is at 100,000 feet, it was revealed by firing a V-2 rocket to a height of 60 to 70 miles.

Paper strips coated with magnetic iron oxide were used to record sounds, voices and music.

The existence of two undiscovered particles without weight or mass, but that may travel with the velocity of light, was indicated by wave studies.

An electromagnet, capable of exerting a pull of 4000 pounds, was developed to study the magnetic and crystal properties of metals.

A simple process for obtaining activated carbon from anthracite coal was developed.

Redness of human hair was found to be proportional to the amount of a newly isolated organic compound of iron.

Triglycine hydroperiodide was found an effective new disinfectant for drinking water for Army canteens.

Low-temperature electric dry cells of the calcium chloride-ammonium chloride type were found suitable for use in Arctic climate.

Titanium compounds were found to be suitable substitutes for condensor-grade mica in electrical applications and other dielectric uses.

Heat-absorbing, color-transmitting glass was developed to permit projection of motion pictures in original colors and protection of television actors from the intense heat of floodlights.

An alloy of cobalt and chrome that shows temperature by color changes was developed.

A substitute for carbon black that can be used without discoloring rubber was produced from sand.

Helium was used successfully as a tracer to determine underground conditions in oil fields.

Freon chemical compounds were found to be more effective in extinguishing gasoline fires than the long-used carbon dioxide and other inert gases.

The sweetest substance known, a new compound 4000 times as sweet as sucrose, was developed from benzene.

Synthetic rubber, made from isoprene by an improved process, had more bounce and more stretch.

A 1000-watt mercury vapor lamp was developed to give three times the light of a 1000-watt incandescent bulb.

Trioxane heat tablets, which burn without odors or poisonous gases and produce a steady blue flame

INSECT REPELLENT "448" appeared to be possibly the best of various new preparations of its type. It is a mixture of 2-cyclo-hexyl cyclohexanol and 2-phenyl cyclohexanol, developed at the Naval Medical Research Institute after tests on some 2000 trial preparations. Indications are that it will be acceptable for general use, although toxicity studies are still in progress. Development of 448 is largely credited to Lt. Comdr. Michael Pijoan (right) and Lieut. Leo Jachowski, Jr., shown above.

not easily extinguished by wind, were developed.

Aluminum powder added to priming coats on wood improves the fire-retardant properties of paint, it was discovered.

Phosphorescent plastics, that glow visibly for six to eight hours after exposure to sunlight or other illumination, were developed.

The Nobel prize in physics was awarded to Dr. P. W. Bridgeman, Harvard University, for his work on ultra-high pressures.

ATOMIC POWER

Mesotrons, the particles believed to hold the atomic nucleus together, were measured for the first time and found to have a mass 202 times greater than the mass of an electron.

Photographs of atom-smashing in cosmic rays revealed the creation of mesotrons from the disintegration of nuclei.

Neptunium 237, the third chemical element to be split by slow neutrons and made to release atomic power was announced; another isotope of uranium, U-233, was also announced as a fissionable element, which can be formed by bombarding the element thorium.

An institute of nuclear studies, a kind of super-university of the atomic age, was organized in connection with the atomic energy operations concentrated at Oak Ridge, Tenn.

Over 400 artificial radioactive isotopes of ordinary elements have been made public although a considerable number are still in the secret category; many of these isotopes are useful for tracer experiments in chemistry, physics, biochemistry and medicine.

Radioactive isotopes of carbon, sulfur, phosphorus and iodine, by-products of atomic research, were made to order at U. S. atomic energy plants for tracer studies of diseases.

Atoms from atomic nucleus transformations, with energies 10,000 times greater than those involved in ordinary chemical-reactions, were found to create new types of chemical combinations.

A 200,000,000 electron volt beam of heavy hydrogen atomic nuclei was produced for the first time in the world's history with the new 4000-ton supercyclotron.

Radiations equal to those from three grams of radium were produced by a 4,000,000-volt betatron; useful in taking sharper X-ray pictures, the equipment to produce them can be installed for one-tenth the cost of a quantity of radium which would give an equal amount of radiation.

Protons were accelerated by an 85-ton cyclotron to achieve a new energy high of 15,000,000 electron volts.

New atom-smashing machine designs included a 500,000,000-volt cyclotron to smash atoms; a 300,000,000-volt synchrotron, to split protons and neutrons within the nucleus; a 70,000,000-volt synchrotron; a 4000-ton cyclotron that may permit the artificial production of cosmic rays; and an 8,000,000-volt Van de Graaff generator for use in atom smashing; work was begun on a "linear accelerator" atom smasher that may speed the hearts of atoms to billions of volts.

Transmutation of gold into mercury by cyclotron bombardments provided a new standard for length measurements in grinding lenses and testing optical equipment; measurements are made with an accuracy of billionths of an inch by a sharp green light ray, produced by the transmuted mercury.

The State Department released a report on atomic energy control which lifted some of the secrecy surrounding atomic fission and atom splitting; methods of denaturing uranium 235 and plutonium to make them incapable of producing atomic energy were announced.

Electromagnetic processes for the separation of the Uranium 235 isotope from a uranium compound by mass spectrograph methods were revealed.

Civilian control of atomic energy in the United States was placed in the hands of a five-man commission head by David E. Lilienthal, as authorized by the McMahon atomic energy bill. The bill prohibits exchanging atomic information abroad without Congressional approval, and calls for the death penalty for revealing atomic secrets.

Minimum size of the active plutonium for the atomic bomb was revealed to be between 22 and 66 pounds.

The first atomic bomb to be tested under controlled conditions was dropped over Bikini Atoll on July 1; known as "Test Able," the world's fourth atomic bomb damaged half the entire fleet of 73 target ships so badly that at least five sank within a few hours.

The world's fifth atomic bomb sank more than four times the ship tonnage destroyed by the aerial "Test Able" burst, and made all surroundings so radioactive that the area was uninhabitable for a considerable period of time.

Bikini tests showed that rats are more resistant than humans to radiations from atomic explosions; goats and pigs have approximately the same sensitivity as man; guinea pigs are more susceptible to the radiations.

Radon, rare radioactive gas, generated by the second atomic bomb at Bikini, was detected in the atmosphere over Oklahoma three days later.

World control of atomic energy was considered by the United Nations Commission on Atomic Energy, with Bernard Baruch as the United States representative; emphasis was placed on the need for control of human emotions and reactions to atomic power, and on peacetime atomic research into the mysteries of unconquered diseases.

U.S.P.H.S. COMMISSIONS OPEN TO PHARMACISTS

A COMPETITIVE examination for appointment of pharmacist officers in the Regular Corps of the U. S. Public Health Service will be held March 17 to April 16, 1947. Grades available, with their equivalent rank, are: Junior Assistant Pharmacist (2nd lieutenant), Assistant Pharmacist (1st lieutenant), and Senior Assistant Pharmacist (captain).

Regular Corps appointments are permanent and provide opportunities to qualified pharmacists for a life career in a number of fields, including hospital pharmacy, pharmaceutical research, public health programs, medical supply, and quarantine inspection. Assignments are made with consideration of the officer's demonstrated abilities and experience, with opportunity for professional growth and development.

An applicant for the grade of Junior Assistant Pharmacist must be a citizen of the United States, must present a diploma of graduation from an accredited pharmacy school and must satisfactorily pass a physical examination performed by medical officers of the U. S. Public Health Service. Applications for this grade will also be considered from senior students, and those who successfully pass the examination will be considered for appointment after their graduation and licensure.

Applicants for the grade of Assistant Pharmacist must meet the above requirements and must also have had an additional three years of postgraduate professional training or professional experience.

Applicants for the grade of Senior Assistant Pharmacist must meet the requirements for the grade of Assistant Pharmacist and must have had an additional four years of postgraduate professional training or experience.

Entrance pay for Junior Assistant Pharmacist with dependents is $3391 a year, for Assistant Pharmacist with dependents is $3811 a year, and for Senior Assistant Pharmacist with dependents is $4351 a year. Promotions are at regular intervals up to and including the grade of Pharmacist Director which corresponds to full Colonel at $8551 a year. Retirement pay at 64 for Colonel is $4950 a year. Full medical care, including disability retirement at three-fourth's pay, is provided. Expenses of official travel are paid by the government. Thirty days' annual leave with pay is provided. All commissioned officers have full military status until Congress officially declares the war terminated.

Examinations, oral and written, will be given during the period March 17 through April 16, 1947, at places mutually convenient to the applicant and the Service.

Application forms and additional information may be obtained by writing to the Surgeon General, U. S. Public Health Service, Washington 25, D. C.

Completed applications for the Junior Assistant, Assistant, or Senior Assistant grades must be received not later than March 15, 1947, by the Surgeon General of the U. S. Public Health Service.

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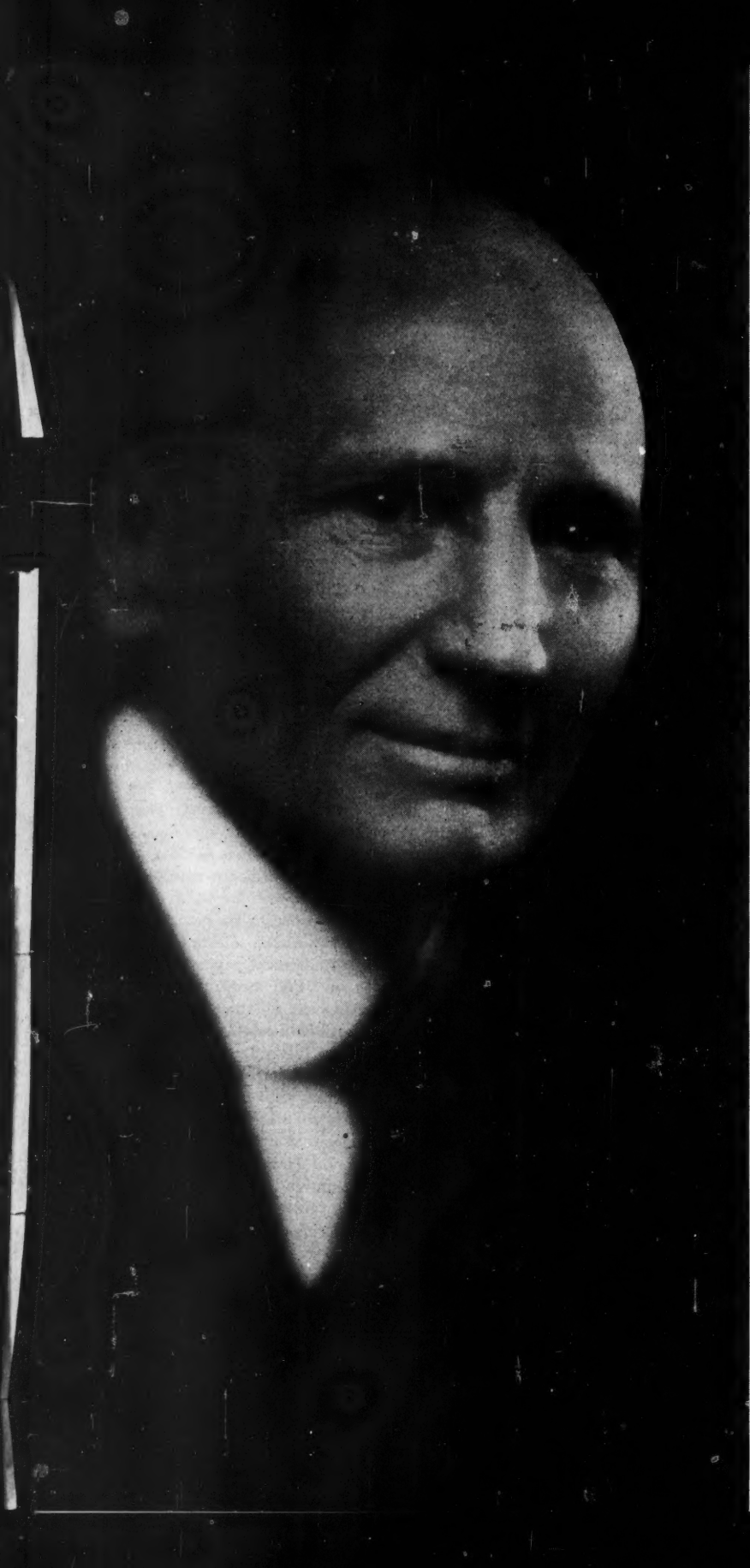

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ISSUE DEDICATED TO MEMBERS
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H. A. B. DUNNING

their professional careers in the service of pharmacy.

Gustavus A. Pfeiffer, one of these members, now director of William R. Warner & Co., Inc., and president of Richard Hudnut, was born of pioneer parents in Cedar Falls, Iowa. His early years on the farm instilled in him a life-long affection for work and love of nature. Following attendance at Cedar Falls elementary and high schools, he studied pharmacy at the Illinois College of Pharmacy. In 1894 Mr. Pfeiffer embarked upon his career in pharmacy by joining his brother in the operation of a retail pharmacy in Parkersburg, Iowa. Responding to an urge to expand his activities, he went to St. Louis in 1901, where he joined his brothers, Henry and Paul, in the organization of the Pfeiffer Chemical Co.

The development of this undertaking led to the purchase of other companies. When William R. Warner & Co. was acquired in 1908, the principal offices and laboratories of the firm were moved to Philadelphia, with G. A. Pfeiffer serving as vice-president and treasurer; his brother, Henry Pfeiffer, as president.

In 1916, with the purchase of Richard Hudnut, the headquarters of the company were moved to New York. Mr. Pfeiffer continued in his position as vice-president and treasurer of William R. Warner & Co. until 1939 when he became president, following the death of his brother, Henry Pfeiffer.

Today the interests of the firm have expanded until its manufacturing laboratories are scattered across the globe: in Buenos Aires, Rio de Janeiro, Capetown, Paris, London, and other foreign cities, as well as in New York, St. Louis, and Toronto.

Although Mr. Pfeiffer turned over the direction and management of the firm last year to Elmer H. Bobst, he continues to serve as a director and consultant.

Devotion to Progress of Pharmacy

Through grants, both from company appropriations and his personal means, Mr. Pfeiffer has repeatedly demonstrated his continuing interest in projects for the advancement of pharmacy and medical science.

When interviewed, Mr. Pfeiffer offered the following guideposts to better living as the essence of his creed.

"Life's Function:
"To discover, develop and constructively use the qualities and talents with which Nature has endowed us.

"Life's Highway:
"Faith: ever believing that however dark the present, the future holds a measure of contentment and peace for us; and, that in the end, right will triumph over might.

"Life's Hope:
"Happiness: harmonious adjustment to our environment.

"Life's Achievement:
"Progress: movement towards perfection.

"Life's Legacy:
"To leave a better world than we found."

Like Mr. Pfeiffer, H. A. B. Dunning may be epitomized as: pharmacist, leader in pharmaceutical industry, philanthropist, and A. PH. A. member with a life-long interest in developing professional pharmacy. Mr. Pfeiffer and Dr. Dunning share the spotlight of the dedication of this issue, which is a tribute to their foresight in making the *Practical Pharmacy Edition* of the JOURNAL OF THE A. PH. A. the important factor which it has become through the seven annual volumes completed last month.

Dr. Dunning's interest in pharmacy dates from his boyhood when he was first employed by George & Redden, Druggists, who served the villagers of his birthplace, Denton, Md. By 1893, when only sixteen years of age, he was at work in Baltimore for Downes Brothers, Druggists. A year later he joined the firm with which he has now been associated for more than a half century.

Meanwhile, he studied pharmacy at the Maryland College of Pharmacy, graduating in 1897. After a stint of duty in the Spanish-American War, serving with the 4th U. S. Volunteers in Cuba, he took postgraduate work in chemistry. Later, Dr. Dunning undertook cooperative research investigations at Johns Hopkins Hospital and Medical School, leading to the production of a number of original compounds and drug products.

He became part owner of Hynson, Westcott & Co. in 1901, assumed active direction of the organization eleven years later, and in 1930 became sole owner. Upon incorporation of Hynson, Westcott and Dunning in that year, Dr. Dunning became president, offering employees an opportunity to become stockholders. He is currently chairman of the Board of Directors of the firm, which distributes its pharmaceutical products throughout the world. Dr. Dunning now has three sons in important executive positions with the organization, all holding Ph.D. degrees from Johns Hopkins University.

Through the years Dr. Dunning has played an active part in the development of the AMERICAN PHARMACEUTICAL ASSOCIATION both through personal service and through grants to advance

the cause of professional pharmacy. Although he is honored here primarily for his co-sponsorship of the establishment of this edition of the JOURNAL, attention must also be called to his substantial contribution in both time, foresight and financial aid which made the A. PH. A. headquarters building a reality, and to his recent grant for the erection of a memorial flagstaff to honor pharmacists who served their country in time of war.

Equally significant has been his continuous service to the ASSOCIATION in a long series of official posts: in committees, in the sections, in local branch work, on the Council, and as president of the ASSOCIATION. He is currently a member of the Council and has just been re-elected for a three-year term.

A Life of Service

Many other organizations, both public and professional, have had the benefit of Dr. Dunning's service. To illustrate, one may recall his service as the first captain of the first Life Savings Corps; his contributions as first vice-president of the Pharmacopœial Convention and as a member of the National Formulary Committee; his service as associate professor of chemistry at the University of Maryland Department of Pharmacy; as president of the Maryland Pharmaceutical Association; as first subscriber and one of those who developed the National Fellowship Movement at Johns Hopkins University; as the donor of the first scholarship for graduate work in a United States school of pharmacy; as chairman of the Scientific Section of the American Drug Manufacturers' Association; councilor to the Department of Chemistry, Johns Hopkins University; and his interest in the Nurses National Memorial Campaign.

Making it a practice to give away 15% of his annual income for charitable purposes, Dr. Dunning has contributed substantially to many worth-while philanthropic and non-profit endeavors in the American scene.

In recognition of his outstanding services to pharmacy, Dr. Dunning received the Remington Medal in 1926. He has received honorary degrees from the Philadelphia College of Pharmacy and Science, University of Maryland, Washington College, and Johns Hopkins University.

From the diversified public and professional interests to which men like Mr. Pfeiffer and Dr. Dunning give support and dedicate their efforts, it is seldom possible to select one as more significant than another. However, the development and future promise of the *Practical Pharmacy Edition* as a medium of professional service to the practicing pharmacist marks it as an activity destined to take its place among the most productive of their many contributions to pharmacy.

The discussions, recommendations, and actions of the ASSOCIATION and its Council in finally consummating the proposed practical pharmacy journal are of general interest on this anniversary. As far back as the early 1930's the general idea of the *Practical Pharmacy Edition* had crystallized from the needs of practicing pharmacists for a publication that would be devoted exclusively to their professional services and problems.

After a number of conferences, the project was readied for presentation to the ASSOCIATION through recommendations in the 1935 convention address of President Robert P. Fischelis. The recommendations adopted by the ASSOCIATION that year read as follows:

Recommendation No. 7—It is recommended that the contents of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION be confined to scientific and professional papers of permanent value or significance, to the monthly abstracts of pharmaceutical literature and to editorials dealing with scientific and professional matters. It is further recommended that as soon as this change can be brought about, the material of general interest now appearing in the JOURNAL together with helpful papers and articles on professional and economic subjects be issued in the form of a new monthly publication directed particularly to the retail pharmacists of the United States. It is further recommended that this publication carry no advertising.

Recommendation No. 8—It is recommended that the new JOURNAL referred to in the preceding recommendation be mailed to the members of all state pharmaceutical associations upon payment of a small per capita tax by the respective state associations and that it be issued with the cooperation of the N. A. R. D. if the plans for unification and coordination of the activities of state associations and the two national associations now under discussion are consummated.

Subsequently the task of establishing the new publication and determining its policies received extensive consideration by both the Committee on Publications and the Council. Later in 1935 two special Council Committees were set up to explore the matter further: a Committee on Contents, Scope and Style, and a Committee on Ways and Means.

On August 23, 1936, the Committee on Contents, Scope and Style offered its report to the Council, which was to serve as the basis for establishing what is now the *Practical Pharmacy Edition*.

The following year Chairman Holton was able to announce to the Council that financial aid had been offered by Mr. Pfeiffer and Dr. Dunning to launch the new edition, and the Committee on

Publications was directed to proceed with final plans.

In his address to the 1937 convention, President George D. Beal reviewed the plans to fill the "great need for another journal as a medium for communicating with practicing pharmacists." He pointed out that the Council and various committees had been studying the project for several years, emphasizing that there was no intention to compete with established trade publications.

Although the plans originally called for publication to get under way in 1938, it was to be nearly another two years before the first issue was off the press.

Meanwhile, a report of a Committee on Proposed Publication had been adopted by the Council in modified form. It was to be a "simple but dignified" monthly publication, with an editorial policy based on the original recommendations presented by the Committee on Contents, Scope and Style in 1936. The title originally proposed as the "News Edition" of the JOURNAL, eventually emerged as the "*Practical Pharmacy Edition*" after further study by the Committee on Publications.

It was agreed "that advertising be accepted, and that the type and amount of advertising be determined by the Committee on Publications." Applying the ASSOCIATION'S code of advertising standards, unique in pharmaceutical publishing, has assured the high professional quality of advertising from ethical firms that characterizes the advertising pages of the JOURNAL.

Off the Press

In 1939 the Council took the final step, after hearing a special supplemental report from the Committee on Publications. Publication would start in January, 1940, with the late Dr. E. F. Kelly, then secretary of the ASSOCIATION, serving as editor.

It soon became evident that a full-time editor would be necessary if the *Practical Pharmacy Edition* was to fulfill its early promise. In August, 1940, Robert P. Fischelis, a Council member with wide editorial experience, was appointed associate editor to carry most of the editorial burden until more permanent arrangements could be made.

The first year marked a period of evolution in typographical style and format. Several changes may be noted in the August issue, including a more attractive cover which bore the first cover illustration to be used.

The second year of publication, in January, 1941, brought to the *Practical Pharmacy Edition* its first full-time editor: Robert W. Rodman, formerly of *Druggists Circular*.

With the first issue of volume II, the *Practical Pharmacy Edition* was further modernized in appearance, establishing a style that is still used today with minor modifications.

The *Practical Pharmacy Edition* soon made a place for itself in pharmaceutical journalism as a professional publication for the practicing pharmacist, representing the pharmacist's national professional organization.

In October, 1943, the present editor, Glenn Sonnedecker, pharmacist and formerly of the editorial staff of Science Service, succeeded Mr Rodman who had accepted a position in pharmaceutical advertising.

For the Practicing Pharmacist

Through the past seven years the *Practical Pharmacy Edition* has steadily grown in circulation, size, and in acceptance by the nation's pharmacists. It has brought to practicing pharmacists the thinking and guidance of their professional organization on current problems of the day. It has given the pharmacist modern "know-how" to keep pace with rapid changes in pharmacy and medicine. For example, it was the first to provide comprehensive information on penicillin; it was the first to offer authoritative data on influenza virus vaccine; it was the first to provide extensive material on streptomycin for pharmacists from the pen of the discoverer of the drug; it was the first to publish regularly for pharmacists the reports of the Council on Pharmacy and Chemistry; and the first to publish the reports of the Council on Dental Therapeutics.

Its objective has been to contribute impartially and courageously to a more rational, progressive practice of pharmacy.

Starting with the October, 1945, issue the *Practical Pharmacy Edition* has been a fourth larger than at any previous time. Plans are already being considered for further expansion in the publication's size and services.

Past and future service to American pharmacists will, it is hoped, justify the confidence and support G. A. Pfeiffer and H. A. B. Dunning placed in this A. PH. A. venture, which made Vol. 1, No. 1 possible seven years ago this month. To their foresight this issue is dedicated; to fulfilling their vision of better pharmacy through A. PH. A. editorial leadership, future issues of the JOURNAL will be dedicated.

NITRATE-ZEPHIRAN INCOMPATIBILITY

by C. LEE HUYCK and EDWARD D. DAVY*

ZEPHIRAN is a mixture of high molecular alkyl-dimethyl-benzyl ammonium chlorides, which is official in U. S. P. XIII under the title benzalkonium chloride. An aqueous solution of Zephiran 1:3000 containing 3% ammonium nitrate was found to be incompatible and unstable, in that a colloidal white precipitate was formed when the ammonium nitrate was dissolved in the Zephiran solution.

An attempt was made to find out why nitrates are incompatible with an aqueous solution of Zephiran. An excess of nitric acid U. S. P. and an excess of ammonium hydroxide T. S. were added to separate portions of the cloudy solution. Since no visible change in appearance took place in either of the solutions, a change in the hydrogen ion concentration had little or no effect on the precipitate.

An excess of nitric acid U. S. P. and an excess of ammonium hydroxide T. S. were added to separate small portions of the 1:3000 aqueous solution of Zephiran. With nitric acid a white precipitate was formed while with the ammonium hydroxide T. S. there was no visible change.

Since a precipitate was formed with both the ammonium nitrate and nitric acid, the precipitate was caused by the nitrate ion and not by the action of the salt or by a shift in the hydrogen ion concentration. The precipitate disappeared when the solution was warmed to 35° C.

With the thought that the precipitate might be a water insoluble oxidation product of the mixture of the high molecular alkyl-dimethyl-benzyl ammonium cation, a small portion of the cloudy solution was shaken with ether with no visible change in the appearance of the solution.

Distilled water at room temperature was added to a small portion of the cloudy solution. When the solution was diluted with five volumes of distilled water, a clear solution developed. Since it is known that a mixture of high molecular alkyl-dimethyl-benzyl-ammonium nitrates are less soluble in water than the corresponding chlorides, the formation of a mixture of high molecular alkyl nitrates was probably the cause of the precipitation.

Various concentrations of ammonium nitrate were used and it was found that if the concentration of ammonium nitrate was kept under 0.5%, no precipitate would form.

Strychnine nitrate 2.3% was found to be compatible with an aqueous solution of Zephiran 1:3000. This is not surprising because strychnine nitrate contains 15.82% nitrate anion while ammonium nitrate contains 78.72% nitrate anion. The quantity of strychnine nitrate that would theoretically be required to produce precipitation is greater than the solubility of strychnine nitrate in water at room temperature.

When the minimum amount of troublesome anion or cation is found for one compound, a simple calculation will usually indicate about what concentration will cause trouble when other ionizable salts containing the troublesome anion or cation are added. In the case of pilocarpine nitrate containing 23.24% nitrate anion, 1.7% of pilocarpine nitrate is necessary to produce precipitation as may be seen from the following calculation:

$$\frac{78.72\%\ (\%\ \text{nitrate anion in ammonium nitrate})}{23.24\%\ (\%\ \text{nitrate anion in pilocarpine nitrate})} \times$$

0.5% (minimum percentage concentration of ammonium nitrate causing precipitation) =

1.7% (theoretical percentage concentration of pilocarpine nitrate producing precipitation)

Practically, when 1.7% of pilocarpine nitrate is dissolved in 1:3000 aqueous solution of Zephiran a faint white cloudiness is produced.

Summary

1. The incompatibility of soluble nitrates with an aqueous solution of Zephiran 1:3000 is probably due to the formation of a mixture of high molecular alkyl-dimethyl-benzyl-ammonium nitrates which are only slightly soluble in water.

2. The incompatibility of soluble nitrates with an aqueous solution of Zephiran depends upon the character and the concentration of nitrate used.

3. When a minimum amount of anion or cation which causes precipitation is known, a simple calculation will indicate about what concentration will cause incompatibility when another ionizable salt containing the same troublesome anion or cation is added.

Presented to the Section on Practical Pharmacy, AMERICAN PHARMACEUTICAL ASSOCIATION, 1946 meeting, Pittsburgh.

* Sterling-Winthrop Research Institute, Rensselaer, New York.

Publications was directed to proceed with final plans.

In his address to the 1937 convention, President George D. Beal reviewed the plans to fill the "great need for another journal as a medium for communicating with practicing pharmacists." He pointed out that the Council and various committees had been studying the project for several years, emphasizing that there was no intention to compete with established trade publications.

Although the plans originally called for publication to get under way in 1938, it was to be nearly another two years before the first issue was off the press.

Meanwhile, a report of a Committee on Proposed Publication had been adopted by the Council in modified form. It was to be a "simple but dignified" monthly publication, with an editorial policy based on the original recommendations presented by the Committee on Contents, Scope and Style in 1936. The title originally proposed as the "News Edition" of the JOURNAL, eventually emerged as the "*Practical Pharmacy Edition*" after further study by the Committee on Publications.

It was agreed "that advertising be accepted, and that the type and amount of advertising be determined by the Committee on Publications." Applying the ASSOCIATION'S code of advertising standards, unique in pharmaceutical publishing, has assured the high professional quality of advertising from ethical firms that characterizes the advertising pages of the JOURNAL.

Off the Press

In 1939 the Council took the final step, after hearing a special supplemental report from the Committee on Publications. Publication would start in January, 1940, with the late Dr. E. F. Kelly, then secretary of the ASSOCIATION, serving as editor.

It soon became evident that a full-time editor would be necessary if the *Practical Pharmacy Edition* was to fulfill its early promise. In August, 1940, Robert P. Fischelis, a Council member with wide editorial experience, was appointed associate editor to carry most of the editorial burden until more permanent arrangements could be made.

The first year marked a period of evolution in typographical style and format. Several changes may be noted in the August issue, including a more attractive cover which bore the first cover illustration to be used.

The second year of publication, in January, 1941, brought to the *Practical Pharmacy Edition* its first full-time editor: Robert W. Rodman, formerly of *Druggists Circular*.

With the first issue of volume II, the *Practical Pharmacy Edition* was further modernized in appearance, establishing a style that is still used today with minor modifications.

The *Practical Pharmacy Edition* soon made a place for itself in pharmaceutical journalism as a professional publication for the practicing pharmacist, representing the pharmacist's national professional organization.

In October, 1943, the present editor, Glenn Sonnedecker, pharmacist and formerly of the editorial staff of Science Service, succeeded Mr Rodman who had accepted a position in pharmaceutical advertising.

For the Practicing Pharmacist

Through the past seven years the *Practical Pharmacy Edition* has steadily grown in circulation, size, and in acceptance by the nation's pharmacists. It has brought to practicing pharmacists the thinking and guidance of their professional organization on current problems of the day. It has given the pharmacist modern "know-how" to keep pace with rapid changes in pharmacy and medicine. For example, it was the first to provide comprehensive information on penicillin; it was the first to offer authoritative data on influenza virus vaccine; it was the first to provide extensive material on streptomycin for pharmacists from the pen of the discoverer of the drug; it was the first to publish regularly for pharmacists the reports of the Council on Pharmacy and Chemistry; and the first to publish the reports of the Council on Dental Therapeutics.

Its objective has been to contribute impartially and courageously to a more rational, progressive practice of pharmacy.

Starting with the October, 1945, issue the *Practical Pharmacy Edition* has been a fourth larger than at any previous time. Plans are already being considered for further expansion in the publication's size and services.

Past and future service to American pharmacists will, it is hoped, justify the confidence and support G. A. Pfeiffer and H. A. B. Dunning placed in this A. PH. A. venture, which made Vol. 1, No. 1 possible seven years ago this month. To their foresight this issue is dedicated; to fulfilling their vision of better pharmacy through A. PH. A. editorial leadership, future issues of the JOURNAL will be dedicated.

NITRATE-ZEPHIRAN INCOMPATIBILITY

by C. LEE HUYCK and EDWARD D. DAVY*

ZEPHIRAN is a mixture of high molecular alkyl-dimethyl-benzyl ammonium chlorides, which is official in U. S. P. XIII under the title benzalkonium chloride. An aqueous solution of Zephiran 1:3000 containing 3% ammonium nitrate was found to be incompatible and unstable, in that a colloidal white precipitate was formed when the ammonium nitrate was dissolved in the Zephiran solution.

An attempt was made to find out why nitrates are incompatible with an aqueous solution of Zephiran. An excess of nitric acid U. S. P. and an excess of ammonium hydroxide T. S. were added to separate portions of the cloudy solution. Since no visible change in appearance took place in either of the solutions, a change in the hydrogen ion concentration had little or no effect on the precipitate.

An excess of nitric acid U. S. P. and an excess of ammonium hydroxide T. S. were added to separate small portions of the 1:3000 aqueous solution of Zephiran. With nitric acid a white precipitate was formed while with the ammonium hydroxide T. S. there was no visible change.

Since a precipitate was formed with both the ammonium nitrate and nitric acid, the precipitate was caused by the nitrate ion and not by the action of the salt or by a shift in the hydrogen ion concentration. The precipitate disappeared when the solution was warmed to 35° C.

With the thought that the precipitate might be a water insoluble oxidation product of the mixture of the high molecular alkyl-dimethyl-benzyl ammonium cation, a small portion of the cloudy solution was shaken with ether with no visible change in the appearance of the solution.

Distilled water at room temperature was added to a small portion of the cloudy solution. When the solution was diluted with five volumes of distilled water, a clear solution developed. Since it is known that a mixture of high molecular alkyl-dimethyl-benzyl-ammonium nitrates are less soluble in water than the corresponding chlorides, the formation of a mixture of high molecular alkyl nitrates was probably the cause of the precipitation.

Various concentrations of ammonium nitrate were used and it was found that if the concentration of ammonium nitrate was kept under 0.5%, no precipitate would form.

Strychnine nitrate 2.3% was found to be compatible with an aqueous solution of Zephiran 1:3000. This is not surprising because strychnine nitrate contains 15.82% nitrate anion while ammonium nitrate contains 78.72% nitrate anion. The quantity of strychnine nitrate that would theoretically be required to produce precipitation is greater than the solubility of strychnine nitrate in water at room temperature.

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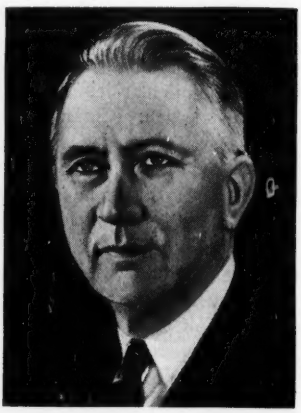
Presented to the Section on Practical Pharmacy, American Pharmaceutical Association, 1946 meeting, Pittsburgh.

* Sterling-Winthrop Research Institute, Rensselaer, New York.

A. PH. A. OFFICERS-ELECT

SYLVESTER H. DRETZKA
President-Elect

AUGUSTUS J. AFFLECK
1st Vice-President-Elect

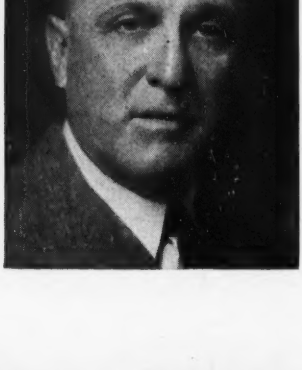


ROY L. SANFORD
2nd Vice-President-Elect

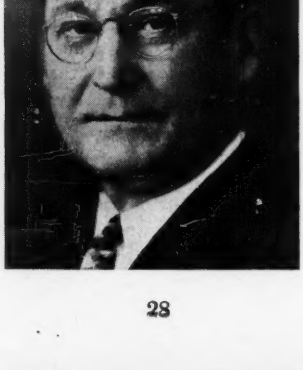
RESULTS of the election for officers of the AMERICAN PHARMACEUTICAL ASSOCIATION, 1947–1948 term, have been announced by Secretary Robert P. Fischelis. The following successful candidates will be installed at the annual convention to be held in Milwaukee the week of August 24, 1947: Sylvester H. Dretzka, Milwaukee, Wis., president-elect; Augustus J. Affleck, Sacramento, Calif., first vice-president-elect; Roy L. Sanford, Enid, Okla., second vice-president-elect. Members-elect of the A. PH. A. Council for a term of three years are: Bernard V. Christensen, Columbus, Ohio; H. A. B. Dunning, Baltimore, Md.; and George A. Moulton, Peterborough, N. H.

Officers are elected by a mail ballot submitted to all members of the ASSOCIATION in good standing. The ballots are opened and counted by a Board of Canvassers appointed by the President, and the results certified to the Secretary. The Board of Canvassers this year consisted of: Charles W. Bliven, chairman, W. Paul Briggs and Lloyd W. Hazleton, who met on December 30 and were assisted in their tabulations by Maj. Bernard Aabel, U. S. Army Pharmacy Corps, Commander Paul T. Rees, U. S. Naval Hospital Corps, and Senior Pharmacist R. D. Kinsey, U. S. Public Health Service.

H. A. B. DUNNING
Council Member-Elect



BERNARD V. CHRISTENSEN
Council Member-Elect



GEORGE A. MOULTON
Council Member-Elect

A REPORT . . .

CONFERENCE ON ARMY PHARMACY

AS THE time neared when the Surgeon General's bill to establish a Medical Service Corps would be placed before the 80th Congress, the Steering Committee of the Committee on Status of Pharmacists in Government Service held a conference with Army representatives concerning the long-standing controversy over military pharmacy. Because of its importance at this time, the Steering Committee's report of the conference is printed below in full.

Chairman Arthur H. Einbeck emphasizes that the Steering Committee is not empowered to speak for the entire Committee, composed of representatives from the N. A. R. D., A. Ph. A., A. A. C. P., and N. A. B. P. The report does, however, indicate the present status of negotiations with respect to achieving adequate pharmaceutical service in the Army. At the time this issue went to press the full Committee had not yet announced its course of action concerning the Medical Service Corps bill, which includes a Pharmacy Section to replace the present Pharmacy Corps in the Regular Army.

The following report has been confirmed by Surgeon General Kirk as representing an accurate summary of the meeting:

Pursuant to previous instructions from the whole Committee, the Steering Committee made arrangements through Congressman Durham to meet with Gen. Norman T. Kirk, Surgeon General of the Army on November 13. At General Kirk's invitation the committee met with his group at the Army and Navy Club in Washington. Present were Gen. Kirk, Col. Francis Kintz, personnel officer of the Surgeon General; Lt. Col. W. Piper, his assistant; Maj. Bernard Aabel, pharmacy assistant to the Surgeon General; Col. J. H. Michaelis, General Staff; Dr. Robert P. Fischelis, Dr. A. G. DuMez, George H. Frates, Congressman Carl Durham, Arthur H. Einbeck.

The chairman explained the various problems disturbing to pharmacy and further explained that the Steering Committee had no power to make agreements, that we were instructed to work for the retention of the Pharmacy Corps, and if these discussions resulted in the clarification of some points, the problem would still have to be referred to higher authority. The points stressed were:

That there should be some substantial evidence that the Surgeon General's plan for a Medical Service Corps would adequately take care of the pharmaceutical service of the Army.

That educational qualifications should be included as a requirement for admission to the Corps in order that it would not be a substandard one.

That the opportunities for promotion in the Corps should be equivalent to those enjoyed under the present Pharmacy Corps law.

That the appointment of Dr. James H. Kidder as a consultant to the Surgeon General on pharmacy be augmented by the appointment of a committee of consultants so that manufacturing, research, distribution, education, and professional pharmacy be represented to insure that military pharmacy will always be at the peak of development.

That since the standard of pharmaceutical service would depend upon the quality of pharmacist that we could interest to apply for service, the opportunities in the service should be of such a high level as to attract the finest men to the Service.

General Kirk stated that he agreed essentially 100% with the objectives of the Committee, however there were several points advanced by the Chairman which he stated his representatives would discuss more in detail. He reiterated that in order that his Department might effectively function he could not do the job with a lot of small Corps. He said that he hoped that we would not kill the Medical Service Corps but rather give it an opportunity to show what it could do for pharmacy and the other services. The flag of pharmacy would wave just as freely and importantly in such a Corps. He invited us to remain and go into further details with his Staff and the representative of the General Staff present, and apologized that he had to leave early to attend a conference with General Eisenhower. The officers present took up the points one by one and discussed them.

Col. Michaelis stated that the Medical Service Corps Bill was being rewritten in the General Staff, that provisions are being made for the creation of a Pharmacy Section, Optometry Section, and a Sanitary Section in the bill; and that there will be a head of the Pharmacy Section designated who will be a pharmacist and who will be the consultant to the Surgeon General on problems peculiar to the specific section.

Upon questioning he stated, and was supported by Col. Kintz, that in professional problems he would have direct access to the Surgeon General. It was stated that in addition to the professional duties of pharmacy, other many and varied administrative duties in the Corps would be the responsibilities of members of the Pharmacy Section. Upon

being questioned as to who would head the Service Corps, Col. Kintz stated that it was reasonable to assume that ultimately it would be a pharmacist, since the pharmacy group would be the largest represented in the Corps.

Col. Michaelis stated that the promotion set up would be as great as possible considering the needs of the service. He covered the present general army situation and said that the contemplated set up would allow for approximately 60% junior officers and approximately 40% field officers of the rank of major or over. This compares favorably with the over-all army set up which is between 37% and 38% field officers. The contemplated Tables of Organization estimates that 2% of the officers of the Corps would be colonels. The needs of the service will govern these percentages, by requested changes in legislation from time to time. He stated that the contemplated strength of the Corps would be 1600 officers, they would like 500 of these to be pharmacists, and that Gen. Eisenhower has given permission to hold approximately 500 vacancies for Medical Service Corps for graduates of colleges. "You tell us the colleges you want us to pick from and we will take them from these schools," said Col. Michaelis.

Colonel Kintz stressed that the development of pharmacy in the Army would depend largely upon the initiative and the qualifications of the officer heading the Pharmacy Section. He admitted to the unfortunate pharmaceutical conditions in the Army during the war, particularly as pertaining to the status of the pharmacist. These things he said would all be corrected in this contemplated Medical Service Corps set up with its Pharmacy Section. He said that he thought the committee of consultants a good one and would tend to keep the head of the Pharmacy Section "on the ball."

Upon being questioned Maj. Aabel stated that the "blue print" on the Pharmacy Corps submitted some months ago to the Surgeon General was being applied at the present time. He cited the assignment of Pharmacy Officers to take charge of the pharmacies of the larger medical installations. It was also pointed out here that the "blue print" would form the basis of a pharmacy plan for the induction of pharmacists into the service in time of war, similar to the plan of the induction of physicians and dentists during the war just passed.

Col. Kintz stressed that the pharmacy officer heading the Pharmacy Section would make the rounds all over the Army and would naturally make the recommendations that would place the profession in the service on a high plane.

The committee took the opportunity to present some evidence of bad pharmaceutical service that existed during the war just concluded.

The Steering Committee and Mr. Durham reviewed the conference that had just been completed and arrived at the following conclusions:

1. That the relationship between the profession of Pharmacy and the Army manifested by today's frank discussions showed much improvement.

2. That there seemed to be a sincere desire on the part of Surgeon General Kirk, his Staff and the General Staff as represented at the conference to work out a satisfactory solution to the problem.

3. That the Medical Service Corps with its contemplated standard of educational requirement would place pharmacists on an equal basis with professions holding satisfactory degrees. The contemplated set up would raise the prestige of pharmacy in the Army placing it on par with bacteriologists and sanitary engineers.

4. That the Medical Service Corps with its Pharmacy Section would provide a satisfactory pharmaceutical service in the Army.

5. That the Medical Service Corps with its Pharmacy Section would provide adequate direction, should a pharmacist be the head of the Pharmacy Section and have direct access to the Surgeon General as an adviser on professional matters.

6. That the Medical Service Corps with its Pharmacy Section will provide opportunities for the placement of more pharmacists than under the present Pharmacy Corps law, even with possible suitable amendments, and will provide for a greater variety of assignments.

7. That the Medical Service Corps with its Pharmacy Section will give the profession of pharmacy in the Army sufficient authority to advise the Surgeon General on and direct the pharmaceutical service of the Army.

8. That insisting on a separate Corps might be doing pharmacy a disservice by limiting its duties, causing friction and non-cooperation by the Surgeon General, his Staff and the General Staff.

9. That there is grave doubt that an amended Pharmacy Corps law that would be satisfactory to us could be ultimately passed and signed.

10. That the over-all plan indicated by the Surgeon General's Medical Service Corps will sound practical to many Army people in Congress, since its operation has been generally proved in combat and has the approval of the General Staff.

11. That Congressman Durham after having elicited the assent that a copy of the final draft of the Medical Service Corps bill would be submitted to the Committee for study prior to being introduced, has stated that in his opinion the Committee would do well to go along with the Surgeon General providing the bill that is finally presented will provide the machinery that will help the Surgeon General, his Staff and the General Staff do the things that were promised to us today.

12. In the light of the improved situation the Steering Committee felt that the joint conference of the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists should give further consideration to the work of this Committee and express its opinion as to procedure.

STEERING COMMITTEE, COMMITTEE ON STATUS OF PHARMACISTS IN GOVERNMENT SERVICE

Arthur H. Einbeck, Chairman
George H. Frates
A. G. DuMez.

PHARMACY WEEK PLANS COMPLETED

NATIONAL Pharmacy Week for 1947, to be observed April 20–26, will inaugurate a new policy for making this annual event an outstanding contribution to health education in the United States. In cooperation with the American Cancer Society, the forthcoming Pharmacy Week will be dedicated to the cancer control program. Thus American pharmacy will make an important contribution to a public health program of major significance.

In expanding National Pharmacy Week the AMERICAN PHARMACEUTICAL ASSOCIATION will preserve the traditional features of the Pharmacy Week observance but will add an opportunity for the pharmacist to demonstrate his function as a source of public health information. Coordinated effort on the part of pharmacists with local units of the American Cancer Society during Pharmacy Week is expected to make a strong impress upon the public.

The Pharmacy Week Committee invites the participation of every pharmacist during April 20–26. About February 10 a mailing will be received by every pharmacy in the United States. This material outlines the program and includes a pledge card that must be returned to the Pharmacy Week Committee as a request for a window display and leaflets for use during Pharmacy Week.

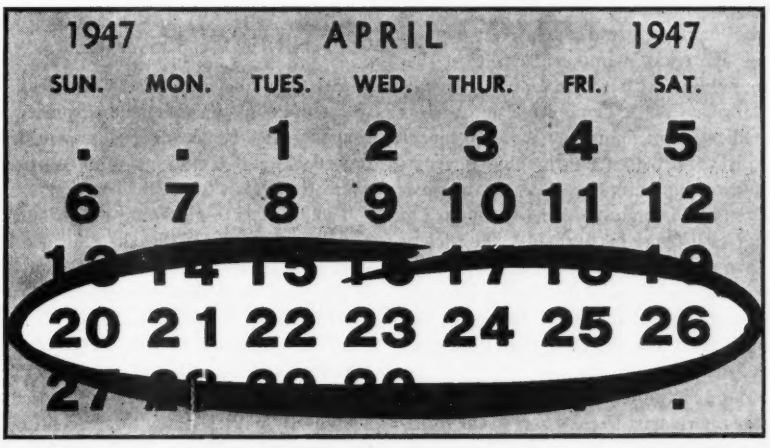
The colorful official display, on card stock, will be delivered to your pharmacy ready for installation—if the pledge card is returned. There is no charge for Pharmacy Week participation materials. Chairman Tom D. Rowe of the Pharmacy Week Committee emphasizes, however, that the number of pledges returned will determine the number of displays and other free participation materials to be produced. Since the pledge cards will also be used as a mailing list to deliver materials, he points out that it is of utmost importance for pharmacists to sign and mail the pledge card promptly upon receipt.

This is the first year that a complete Pharmacy Week window display has been offered without charge to every pharmacy in the country. In addition to emphasizing the pharmacist's professional service to his community, the display will include educational material on the control of cancer. This will be supplemented by a supply of Pharmacy Week leaflets on cancer control, obtainable along with the display by return of the pledge card which each pharmacy will soon receive by mail.

Plans are also being made for broadcasts at the national level, and radio scripts and announcements will be available for local use. There will be recognition by government officials, a public relations program for the press, and ample material available for Pharmacy Week addresses before civic clubs, high school assemblies and other public gatherings.

The window display competition will be con-

PLAN NOW TO PARTICIPATE IN PHARMACY WEEK



A PROGRAM FOR THE PRACTICING PHARMACIST

ducted as in former years. The Committee hopes that pharmacists throughout the country will devote two windows to professional material during Pharmacy Week: one window for the official display; a second for an original display expressive of the individual pharmacy for entry in the national competition.

Retail pharmacy displays will compete for the Robert J. Ruth Trophy, and a separate A. PH. A. award will go to the best display at colleges of pharmacy. A new division of the competition will provide awards for displays or exhibits in public places other than a retail pharmacy such as libraries, theater lobbies, banks and public-utilities windows. Any pharmacist or group of pharmacists—including state and local associations and A. PH. A. branches—may have an entry in this new division, which offers extensive public relations possibilities.

The Pharmacy Week Committee asks that pharmacists begin planning local programs and exhibits now. Further details will be issued from time to time through pharmaceutical publications and national and state associations.

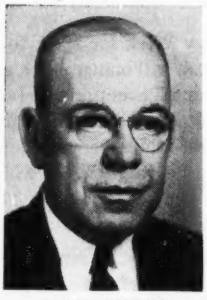
A Greater Stature

The scope of the new program brings to Pharmacy Week a stature and opportunity for service that pharmacists believe will provide national recognition to the profession and the participating pharmacist. The possibilities of the new program are limited only by the extent to which individual pharmacists are willing to utilize the services being offered, the Pharmacy Week Committee points out. Every pharmacist who participates will (1) contribute materially to the education of the public on one of our great public health problems, and (2) improve his professional status in the community and conclusively demonstrate the pharmacist's important role in disseminating public health information.

The Pharmacy Week Committee emphasizes that the dedication of Pharmacy Week to cancer control April 20–26 does not involve pharmacists in fund raising activities that the American Cancer Society will conduct during the month of April to finance its work in this field. The Society and the AMERICAN PHARMACEUTICAL ASSOCIATION alike recognize the need for placing information on cancer control in American homes and minds, and it is to this objective that Pharmacy Week is dedicated.

The A. PH. A. is joined by the N. A. R. D. in urging every pharmacist to take part in the forthcoming observance.

VICE-PRESIDENT OF THE A. PH. A.



A. LEE ADAMS

A. LEE ADAMS, retail pharmacist from Glencoe, Ill., is the first vice-president of the AMERICAN PHARMACEUTICAL ASSOCIATION for the 1946–1947 term. Mr. Adams has served as president of the National Association of Boards of Pharmacy, and has been a member of the Illinois Board of Pharmacy since 1938. As a member of the Board, he was influential in establishing better facilities for conducting pharmacy examinations for registration in Illinois. Prior to his election as president of N. A. B. P., he served as vice-president of the organization and as chairman of District 4.

Born in Chicago where he attended grade school, Mr. Adams later resided in Winnetka. Here he attended high school and in 1905 began his apprenticeship in pharmacy. He was graduated from the Northwestern University College of Pharmacy in 1909. Obtaining his pharmacist's license in Illinois by examination, he opened a retail pharmacy in Winnetka, where he practiced until 1933. Later he acquired the pharmacy which he now operates at Glencoe.

Mr. Adams is a member of the American Legion, a Rotarian, and a Mason. He has also served as president of the Glencoe Chamber of Commerce.

(For biographical sketch of President Serles see September, 1946, issue.)

CLEANING GLASSWARE

Although concentrated sulfuric acid saturated with potassium or sodium dichromate has been generally used for cleaning glassware, it has been reported that it is extremely difficult to rid glassware of all the "cleaning solution."

Ten rinsings of glassware with water removed all dichromate from the glass surface but there were still appreciable amounts within the glass. If the glass were allowed contact with water for several hours, it would yield the dichromate to solution. Because of this factor and its great toxicity for living cells and enzymes, it is believed advisable to clean glassware by another method, such as 10% nitric acid, a detergent, or 1 to 5% trisodium phosphate. —*Science 104: 426, 1946*

PRESCRIPTION Information SERVICE

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GUAIAC PRECIPITATES

Upon standing, the following prescription forms a hard precipitate. What is the precipitate, and how may it be prevented?

Sodium iodide	℥ *ii*
Tincture colchicum	℥ *iv*
Sodium salicylate	℥ *iii*
Tincture guaiac ammoniated	℥ *ss*
Syrup sarsaparilla compound, q. s. ad	℥ *vi*

—O. I., Minnesota

The precipitate in your prescription is apparently guaiac. We suggest that you use sufficient strained honey to coat the inside of the bottle. To this add the ammoniated guaiac tincture, and then add with agitation the other ingredients dissolved in the compound sarsaparilla syrup.

SOURCES OF DICOUMARIN

We are interested in obtaining the source of dicoumarin as we would like to get some additional information on it.—D. M., New York

Dicoumarin is marketed in dosage form under the name Dicoumarol by such firms as Abbott Laboratories, Eli Lilly and Co. and E. R. Squibb and Sons.

Strictly speaking, dicoumarin refers to any of a group of compounds but has come to mean specifically 3,3′-methylene-bis-(4-hydroxycoumarin). The name dicoumarol (also spelled dicumarol) has been suggested to distinguish this compound more definitely from other dicoumarins.

Dicoumarol has been extensively studied as a clinical anticoagulant for various forms of thrombosis, with certain advantages over heparin.

USE OF POLYVINYL ALCOHOL

We would like to obtain information on polyvinyl alcohol and the formula for polyvinyl alcohol jelly.—V. P., Texas

Polyvinyl alcohol is a water-soluble plastic with important industrial uses, which has recently become of interest to pharmaceutical and cosmetic manufacturers. It is available in two types: one that is soluble in water at ordinary temperatures but has reduced solubility in water above 65° C.; the other softens and swells in water at ordinary temperatures but does not dissolve until heated to 70° C. or higher.

The latter type might be used to make an aqueous colloidal jelly, in which you are particularly interested, but we do not have information available on this application.

Both types of polyvinyl alcohol are available in various grades of viscosity which represent different stages of polymerization. Perhaps the manufacturer would be able to provide general advice concerning the proper viscosity for a particular use. A supplier is E. I. Du Pont de Nemours & Co., Inc., Electrochemicals Division, Wilmington 98, Del.

Polyvinyl alcohol has been used in the preparation of such medical items as sutures and burn-treating materials. A solution leaves a tough resistant film upon evaporation of water. Where indicated, polyvinyl alcohol in films or various

extruded shapes may be made water resistant by chemical or heat treatment.

There has also been experimentation with the use of polyvinyl alcohol as an emulsifying, dispersing and binding agent. Emulsifying trials should start with at least one part of polyvinyl alcohol to six parts of the material to be emulsified.

Certain aqueous solutions, such as nose drops, may have incorporated in them as much as 3.5% polyvinyl alcohol to increase the viscosity.

Low viscosity polyvinyl alcohol in colloidal solution has also been used as a substitute for blood plasma for such indications as hemorrhage or shock, but it apparently has some dangers and obvious limitations.

A review and bibliography on polyvinyl alcohol appeared in the April, 1945, issue of *Drug and Cosmetic Industry* (101 West 31st St., New York 1, N. Y.).

NEUTRALIZED COCAINE SOLUTION

We have been asked to prepare a neutralized 4% cocaine hydrochloride solution to be used as an anesthetic in certain eye operation procedures. We know that sodium borate is incompatible as is also triethanolamine which causes a flocculent precipitate. Kindly let us know if you have a method to solve this problem.—S. P., Maryland.

If cocaine is made too alkaline, the alkaloid will be precipitated. However, if you use a buffered solution at about *p*H 7 to 7.2, precipitation will not take place. We suggest that you use the phosphate buffer (*p*H 7.2) found in the *U. S. Pharmacopœia XII*, page 771.

Note, however, that neutralized or alkaline cocaine solutions are not as stable as simple aqueous solutions of the hydrochloride, and so the solution should be freshly prepared and dispensed in small quantities.

SUPPLIERS OF PECTIN

Will you kindly advise as to where we may obtain powdered apple pectin.—E. B., West Virginia

You will note that official pectin may be prepared from either the inner portion of the rind of citrus fruits or from apple pomace. We understand that apple pectin is available from the General Foods Corporation, 11th and Hudson Streets, Hoboken, N. J. A principal supplier of pectin N. F. is the California Fruit Growers Exchange, Products Department, Ontario, Calif., which offers a product extracted from the rind of citrus fruits. Prices and descriptive literature are supplied by the Exchange on request.

EMULSIFIED HAIR DRESSING

Could you supply us with a formula for a liquid emulsified hair dressing containing lanolin, and preferably using triethanolamine as the emulsifying agent?—C. Z., Pennsylvania

An emulsified hair dressing is best prepared from an absorption base. The formulation varies a great deal according to the bases used and it is, therefore, difficult to give you an exact formula. Essentially, these hair dressings contain about 20% or more of absorption base, about 30% of mineral oil and the balance water. No alkali is used in their formulation.

Several companies that supply absorption bases have suggestions for making these products. One of them is the American Cholesterol Products, Inc., Milltown, N. J. Still another is the Continental Chemical Company, 2640 Harding Avenue, Detroit 14, Mich.

LOTION MAGNESIUM CARBONATE

We received a prescription calling for lotion magnesium carbonate N. F. When I could not locate a formula the physician told me the lotion he had in mind contained the following ingredients: zinc oxide, magnesium carbonate (light), phenol, oil sweet almond, glycerin, lime water and rose water. We would greatly appreciate your help with this problem.—C. W., Maryland

The preparation you have in mind is probably the lotion of magnesium carbonate and zinc oxide with phenol. Herewith is the formula as given in the third edition of the *Pharmaceutical Recipe Book:*

Phenol	8 Gm.
Zinc oxide	40 Gm.
Light magnesium carbonate	125 Gm.
Expressed almond oil or persic oil	125 cc.
Glycerin	40 cc.
Solution of calcium hydroxide	375 cc.
Water or rose water, a sufficient quantity,	
To make	1000 cc.

Mix the zinc oxide and magnesium carbonate with the expressed almond oil and glycerin to a

smooth paste. Gradually add the solution of calcium hydroxide with constant agitation, and lastly add the water or rose water and phenol, slowly and with constant agitation.

NOTE—Dispense with a "shake well" label.

ANDERSON'S DUSTING POWDER

We have a request for "Anderson's Dusting Powder" and find this listed in the Red Book, page 69 with your ASSOCIATION *as a reference. We would appreciate your advising us what this is, or any information you might give us on this product.—P. M., Ohio*

The formula for "Anderson's Dusting Powder" is given on page 178 of the *Pharmaceutical Recipe Book III* as follows:

Camphor, in fine powder.....	120 Gm.
Starch.....	580 Gm.
Zinc oxide.....	300 Gm.
To make.....	1000 Gm.

Mix intimately and pass through a No. 60 sieve.

The *Pharmaceutical Recipe Book* is a publication of the AMERICAN PHARMACEUTICAL ASSOCIATION and is available at $5. A special price of $3.50 is available to members of the ASSOCIATION.

SUSPENDING SULFUR IN LOTION

We frequently receive the following prescription for an acne lotion, but the dermatologist complains that the sulfur soon separates out:

Resorcinol.....	*3.0*
Acid salicylic.....	*1.5*
Boric acid.....	*8.0*
Precipitated sulfur.....	*8.0*
Spirits camphor.....	*5.0*
Alcohol 70% (ethyl).....	*45.0*
Rose water, q. s.	
To make.....	*120.0*

I have tried the more common types of suspending agents with no success. Could you suggest a base that would make this preparation a smooth creamy mixture and one that would hold the sulfur in suspension indefinitely?—R. G., West Virginia

In shake lotions of this type it is almost impossible to suspend the sulfur because the viscosity is so low and the sulfur particles are so large. In fact, the only satisfactory method of applying sulfur in an even distribution is in a cream, or in a lotion with a viscosity about like calamine liniment. We believe that the addition of about 2% sodium alginate and about 25 cc. of magma of bentonite, N. F. will produce a product in which the sulfur remains suspended much better than it does in the original prescription. The sodium alginate may be obtained from the Kelco Company, 31 Nassau Street, New York 5, and is inexpensive. In our hands this does not produce a perfect suspension but produces a fairly satisfactory one.

DATA ON CHOLINE AND CYSTINE

We have read the article in the July issue of the JOURNAL *on choline and cystine. Could you give us a source of more information on the treatment of cirrhosis of the liver? Also, from what reliable pharmaceutical house can choline and cystine be obtained?—E. D., Oklahoma*

In addition to the reference cited in the JOURNAL the following sources of information may be helpful:

Beckman, H.: "Treatment in General Practice," Fourth Edition, Philadelphia, W. B. Saunders Co., 1943, p. 548.

Hoagland, C. L., and Shank, R. E.: Infectious Hepatitis: A Review of 200 cases, *Journal of the American Medical Association*, 130: 615, 1946. Should you not have the *Journal of the American Medical Association* conveniently available, it may be obtained from the American Medical Association, 535 N. Dearborn St., Chicago, Ill., at $0.25 per single copy.

Both choline chloride and cystine may be obtained from Merck and Company, Rahway, N. J.

DOMEBORO'S SOLUTION

May we have the formula for Domeboro's solution?—H. A., California

Domeboro tablets are supplied by Dome Chemicals, Inc., 250 East 43rd St., New York 17, N. Y. One tablet crushed into a powder and dissolved in one part of water produces Domeboro's solution, containing aluminum subacetate as the principal constituent and also aluminum sulfate, calcium sulfate, calcium acetate and subacetate, aluminum acetate and acetic acid. The solution is said to be indicated wherever Burow's solution may be used.

The Origin of Young's Rule

by HORATIO C. WOOD, JR.*

SEARCH FOR THE OBSCURE SOURCE OF GUIDE TO PROPER DOSES FOR CHILDREN UNEARTHS FASCINATING STORY OF A VERSATILE SCIENTIFIC GENIUS OF EIGHTEENTH CENTURY

RECENTLY one of my colleagues asked me, "Where did 'Young's Rule' come from? Who was Young and on what was his rule based?" I brashly replied, "I don't know but I will find out for you." Little did I guess the time which I was going to spend, nor the fun that I was to have, in the search. Anyone who has gone big-game hunting will tell you that there is more joy in the chase than in the kill; to be sure there is a few minutes' thrill in having accomplished a task but it is only temporary, the real pleasure is tracking down your object.

I started my search through standard works on pharmacology hoping to find whether "Dr. Young" had any Christian name, or the approximate date of his life. Probably if I had been better versed on biographical history I should have started with the assumption that Dr. Thomas Young was the author on the ground that he was the most famous Dr. Young who ever lived; but I had not realized that so spry a rule could be such a venerable patriarch. And it was only after many hours delving in century-old volumes that I was able finally to convince myself of the truth of this view.

Thomas Young, a child prodigy, was one of the most remarkable scientific geniuses that Europe has produced. Largely through self-education he became an accomplished linguist who amused himself translating Shakespeare into Greek, the foremost authority on optics of his generation, discoverer of the key to the demotic Egyptian hieroglyphics, an adviser to the British Admiralty on the building of battleships, a famous physician, the author of a standard work on navigation; and withal a man of unusual social graces, an amateur musician and one of the handsomest men of his day.

Helmholtz, the great German physicist, classified him as "one of the most clear-sighted men who ever lived;" Fielding Garrison, America's foremost medical historian, says: "He was probably the handsomest of all the great physicians."

He was born of Quaker parentage in 1773 in the village of Milverton, in the county of Shropshire —whose name is a byword in medical history as the home of the old crone who taught William Withering the virtues of digitalis only two years after the birth of the county's greatest son. By the time he was four years old Thomas had become an indefatigable reader, having completed *Gulliver's Travels* and read the Bible through; at six years he had committed to memory all of Oliver Goldsmith's famous poem, "The Deserted Village" (a poem of nearly three hundred lines), and was beginning the study of Latin. At thirteen he had read Virgil's *Aeneid* and the first seven books of the *Iliad*, in their original Latin and Greek, and was beginning the study of Hebrew and Persian; eventually he acquired a working knowledge of 17 tongues, ancient or modern.

By the physicists he is remembered as the great protagonist of the undulatory theory of light, as the originator of the "Young-Fresnel law" (of double refraction), as the first to show that the barometric pressure varies at different localities according to elevation, as the discoverer of "Young's modulus" which represents the first use of absolute measurements in elasticity, as the first physicist to measure accurately the "seconds pendulum" and the first to give the modern theory of capillary attraction:

Among the antiquarians he is renowned for his investigations into ancient Egyptian culture but especially for having discovered the key which eventually led to the deciphering of the inscriptions on the Rosetta stone, which in turn opened the door to the history of Egypt.

Presented to the Section on Historical Pharmacy of the AMERICAN PHARMACEUTICAL ASSOCIATION and the American Institute of the History of Pharmacy, Pittsburgh meeting, 1946.

* Professor, Philadelphia College of Pharmacy and Science, Philadelphia, Pa.

By the physiologist he is remembered as the originator of the Young-Helmholtz theory of color vision; as the first to show that the power to focus the eye for near vision was due to ability to change the curvature of the lens; and as the discoverer of the mechanism of astigmatism.

He was already a young man of recognized standing in the scientific world when he turned his attention to medicine. He read his epochal paper on the focusing power of the eye, before the Royal Society, the same year (1792) that he began his medical studies under the famous John Hunter. Later he went to the University of Göttingen from which he graduated in 1796. He began the practice of medicine in London in 1799 but continued his studies at the University of Cambridge, from which institution he received an M.D. in 1803.

In 1811 he was elected a physician to St. George's Hospital in London. Part of the duties of this position was the instruction of medical acolytes; he wrote in his diary shortly after his election, "I have been spending a month on some chemical investigations because I was obliged to give a few lectures on chemistry and pharmacy."

Being a man of strong individuality he often differed vigorously from his conservative colleagues who were prone to be guided in their treatment by traditional theories rather than actual experience. Consequently he was not popular with the medical neophytes—a group which has long been notorious as orthodox comformists; one of them said of him, "Dr. Young is a great philosopher but a bad practitioner." But the hospital apothecary reported that a greater proportion of his patients were discharged cured than of those who had received more fashionable treatment.

Reading the biography of Thomas Young by George Peacock, with its numerous excerpts from his diary and letters, and studying his lively visage, I had become strongly prejudiced in favor of him as the source of this rule of the medical nursery, despite the fact that he is usually called an ophthalmologist in biographical sketches. But of the great amount he is known to have written only a few papers are listed either in the magnificent medical library of the College of Physicians of Philadelphia or in the still larger library of the Surgeon General of the U. S. Army. There seemed only one plausible hope of uncovering the birthplace of the "rule."

In 1807, before he had been elected to St. George's, he wrote to a friend: "I intend seriously to do something in physic by collecting all that is worth knowing. In many other departments of science I have been enabled to draw conclusions from a comparison of experiments of others which I should have been longer in discovering by investigations of my own; why not in physic?"

DR. THOMAS YOUNG

This may seem to be a bombastic boast for a young man still in his early thirties but it should be remembered that he was already a scientist of recognized standing (he was professor of natural philosophy at the Royal Institution, 1801–1803). The idea in the second part of this quotation seems to me a notable evidence of his clear thinking; the actual experimenter is often biased in interpreting his results, the man who attends the results of many investigators has a wider foundation for his conclusions.

In consonance with this expressed purpose Dr. Young published in 1813 a most extraordinary book. It was entitled, "*An Introduction to Medical Literature, including a System of Practical Nosology; Intended as a Guide to Students and an Assistant to Practitioners. Together with Detached Essays, on the Study of Physic, on the Medical Effects of Climate, on Classification, on the Circulation, on Animal Chemistry, on the Blood.* By Thomas Young M.D., F.R. and L.S., Fellow of

the Royal College of Physicians; Physician to St. George's Hospital. London 1813."

Dr. Young published two editions of this book and in 1823 sold the copyright for 100 pounds. The first part of the book is a long essay on the philosophy of medicine with some advice to the novitiate as to the proper method of learning the art. The second, and greater, part of the book is made up as a catalog of what he deems the important writings on medical topics, classified into a number of divisions. There is, for the most part, no sugggestion as to what is to be learned from reading the books mentioned, simply the author's name and the title. At the head of each chapter are a few words concerning the subjects included in the chapter. There is no index to the book; to find any specific reference the only way is to read through the entire book of several hundred pages.

There being no chapter on administration of medicines, nor on dosage, I turned to the chapter entitled "Pharmacology." Alas, this consisted of a dreary desert of names of books and their authors with no word of comment. Hopelessly I was idly thumbing through these pages when my eye was suddenly caught by the glint of this gem sparkling in the literary mud:

...ius, Löse... ...Monro, Batsch, Tode, Kühn, Haller von Vicat, Fourcroy, Mönch, Hildebrand, Cranz, Von Lippert, Plenck, Retzius von Westrumb, Harwood.)

For children under 12 years old, the doses of most medicines must be diminished in the proportion of the age to the age increased by 12: for example, at two years old, to $\frac{1}{7} = \frac{2}{2+12}$. At 21 the full dose may be given. Y.

Eureka? No, I had found "Young's Rule" as enunciated by Young, but I do not know whether this rule was given to him in a celestial vision, or whether he had tediously worked it out by some erudite mathematical formula; nor do I know what evidence he had of the correctness of the rule.

I might point out that Dr. Young was not the first physician to attempt to define a rule for determining the proper doses for children. In 1739 Gaub (often Latinized to Gaubius), professor of pathology at the University of Leyden, published a table of the comparative doses for children which was to be memorized by the apothecary or physican. I have not seen this table of Gaub's in the original, only as quoted by Paris in his famous *Pharmacologia*. According to Gaub's table the dose for an infant of one year should be $^1/_{12}$ of the adult dose, at two years $^1/_8$, at three years $^1/_6$, at four years $^1/_4$; from five to seven years $^1/_3$.

The formula of Dr. Young is so much simpler that it had already entirely superseded the cumbersome older method when Paris wrote his book. But the results arrived at by Young's rule so closely parallel the figures of Gaub's table that one is prone to question whether Dr. Young did not simply reduce Gaub's figures to a mathematical formula.

In 1872 Dr. E. H. Clarke of Boston pointed out that the proper dose for a child should be based on its weight, not its age. In this light, Young's Rule becomes a method for determining the average weight of children. I have thought it of interest to compare the results of the mathematical formula of Young, originated one hundred and fifty years ago, with the statistics of the weight of children today.

TABLE OF WEIGHTS OF CHILDREN

AGE	STATISTICAL AVERAGE	YOUNG'S RULE	COWLING'S RULE
1	20 pounds	11.5 pounds	12.5 pounds
2	25 "	21.4 "	18.7 "
4	35 "	37.5 "	31.2 "
6	43 "	50 "	43.7 "
8	54 "	60 "	56.2 "
10	67 "	68 "	68.7 "
12	81 "	75 "	81.2 "
14	104 "	80.7 "	93.7 "
16	121 "	85.7 "	106.2 "
Adult	150 "	150 "	150 "

It will be noted that from two to ten years there is a fairly close agreement, but that after twelve years of age the rule does not apply with any great degree of accuracy. We should, in all justice, remind ourselves that Dr. Young distinctly states in his own formula for the rule: "for children under twelve years of age." Incidentally attention may be directed to the fact that the rule of Dr. Cowling, which was published some sixty years after Young's, although less accurate for infants is nearer to the statistical average for children over four years than is Young's Rule.

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4. Paris, J. A., "Pharmacologia," American edition, 1822, p. 120.
5. Garrison, Fielding H., "History of Medicine," 4th edition, 1929.

WATCH INCOMING MAIL FOR YOUR PLEDGE CARD

—℞—

OBSERVE PHARMACY WEEK APRIL 20–26

—℞—

AN EXPANDED PROGRAM FOR EVERY PHARMACIST

STREPTOMYCIN EFFECTIVE IN INTESTINAL INFECTIONS

Streptomycin used to treat intestinal tract infections is believed to be less toxic and more effective in smaller doses than the sulfonamides. It may also be effective in cases in which penicillin and the sulfonamides are of limited value. Studies on streptomycin indicate that it is absorbed sparingly from the gastrointestinal tract, does not maintain effective concentrations in the blood, and is excreted with the feces, inhibiting the growth of susceptible bacteria as it is passed along to the rectum. Oral administration of 2 to 4 Gms. daily alters the coliform flora of the alimentary tract within twenty-four to forty-eight hours.

Army Medical Corps physicians reporting on treatment of eight cases of acute and recurrent bacillary dysentery with streptomycin, administered orally or parenterally in doses of 1 to 4 Gms., stated that beneficial effects were obtained in infections by *Salmonella* and *Shigella* resistant to the sulfonamides. Use of the combined oral and parenteral routes is recommended, the duration of therapy usually varying from four to ten days depending on the type and severity of the infection and the duration of symptoms. No toxicity has been observed following oral administration in the doses recommended.

Improvement was generally not dramatic when streptomycin was used in nine cases in which dysentery had progressed to the chronic phase. Future evaluation will be made on the basis of longer courses of combined oral and parenteral streptomycin therapy. Results of a study using streptomycin to treat infectious diarrhea of infants was inconclusive. However, it is believed that it may shorten the period of illness, hospitalization, starvation, and malnutrition.

—*Bull. U. S. Med. Dept., 6: 750 (Dec.) 1946*

STREPTOMYCIN SUPPLY ADEQUATE, FDA ASKS CERTIFICATION LAW

As distribution of streptomycin through normal channels, including retail pharmacies, got under way in December it appeared that over-all supply would be adequate to meet demand. The amount each supplier may distribute for domestic civilian use remains under allocation by the Office of Temporary Controls (formerly CPA). Additional allocations were made the latter part of December, beyond the amounts originally desig-

nated, and January allocations were expected to at least equal the December total.

For clinical use of streptomycin, physicians should use as a guide the Keefer report, which appears on page 461 of the October, 1946, issue of THIS JOURNAL.

Present controls over the distribution of streptomycin are due to expire March 31. This would also bring to an end the present authorization for predistribution testing of streptomycin by the Food and Drug Administration. Since the manufacture and testing of streptomycin is subject to the same vagaries as penicillin, the FDA, through the Federal Security Agency, has asked Congress to authorize continued predistribution checking of samples from each batch. This takes the form of an amendment to the Food, Drug and Cosmetic Act to provide a certification service identical with that established by Congress some time ago for penicillin. The proposed amendment has been approved by the A. PH. A. Council.

In advising manufacturers of the move, Dr. P. B. Dunbar, Commissioner of Food and Drugs, pointed out that "In some respects at least the need for predistribution checking is even greater for streptomycin [than for penicillin]. Its toxicity, particularly in relation to effective dosage, is much higher than that of penicillin. Under-dosage results in the development of highly resistant strains of pathogenic organisms. Its dosage must therefore be much more carefully regulated than that of penicillin and it is even more important that label declarations of potency be accurate."

$R_x R_x R_x R_x R_x$

TREATMENT OF CUTANEOUS INFECTIONS

REVIEWING the present methods of treating cutaneous infections, Dr. Donald M. Pillsbury, Department of Dermatology and Syphilology, University of Pennsylvania Medical School, states that a nonsensitizing and completely satisfactory method of treatment is not yet available. Although normal human skin affords remarkable protection against the bacteria which are responsible for a considerable proportion of cutaneous infections, the factors which apparently play a role in bacterial invasion are not well understood. The report states that disability produced by bacteria is greater than disability produced by fungus infections, hemolytic Staphylococcus aureus and beta hemolytic streptococci being the chief offenders.

Summarizing the present treatment methods with specific reference to preparations commonly used, Dr. Pillsbury suggests that "in the management of cutaneous diseases which are characterized by inflammatory reaction, it is important to avoid the use of measures which may further irritate the skin and to recognize and treat bacterial invasion promptly. . . . It cannot be emphasized too strongly that the use of chemical irritants or of highly sensitizing compounds on infected inflamed skin will result in severe reactions, and in many instances may lead to prolongation of partial disability over a period of weeks or months. Instances of this are regularly seen. In particular, tincture of iodine should never be used; it is a cauterant and skin-sensitizer, and too frequently adds to the burden under which the diseased skin is already laboring."

Methods of treatment for various skin diseases are outlined by the author. In discussing topical penicillin therapy in the treatment of superficial infections of the skin, he states that "the present incidence of sensitivity reactions is apparently over 15%, and this percentage may increase as more persons are exposed to the drug."

Referring to local application of sulfonamides to sites of superficial infection, Dr. Pillsbury concludes that such treatment has little or no place in present day therapy since development of sensitivity results in many patients if proper precautions are not observed. However, sulfonamides administered orally still retain a definite place in the management of certain acute and chronic infections of the skin and can ordinarily be given without severe reactions, provided that reasonable precautions are exercised.

Results of this study indicate the need for development of penicillin or sulfonamide compounds with a decreased capacity for sensitizing the skin and other tissues. There is also need for nonsensitizing chemical antiseptics which have a greater antibacterial power *in vivo* than those now available.

—J. Am. Med. Assoc., 132: 692, 1946

IS HOSPITAL PHARMACY EXPERIENCE INFERIOR?

by LEO F. GODLEY

AMERICAN SOCIETY OF HOSPITAL PHARMACISTS

THE National Association of Boards of Pharmacy is now recommending for immediate adoption by all states minimum standards for evaluation of practical experience. This nine-point plan was evolved by the N. A. B. P. Committee on Study and Correlation of Practical Experience Requirements, and approved at the 1940 convention. Due to conditions brought about by the war, activation of the plan was postponed. At the August convention it was voted that now is the opportune time to institute the new standards.

Hospital pharmacists will agree that the minimum standards are timely and necessary, except for regulation 2 which is pointed in the right direction but seems badly aimed. Regulation 2 reads as follows: "To assure a well rounded practical experience, not more than six months of credit per year shall be given for practical experience obtained in a hospital pharmacy and not more than six months credit per year shall be given for practical experience obtained in a pharmacy or drug-store compounding less than 1000 prescriptions annually or devoting less than fifty per cent of its activity to the sale of drugs and medicines and supplying pharmaceutical service."

In the face of noteworthy advances made in the profession by hospital pharmacists in the last decade or so, this recommendation by a national body has unsavory implications to those of us in hospital pharmacy.

Many hospital pharmacies surpass by far the professional requirements set as a minimum for retail pharmacies under the regulations. We cannot understand the reasoning whereby the experience gained in hospital pharmacies meeting specified standards—experience usually comparable professionally to that gained in the best retail pharmacies—would not be recognized for the merit it deserves.

Can the state boards also maintain that retail pharmacy experience alone is professionally adequate as a qualification for practice in hospital pharmacy? On the one hand the graduate who wishes to take a hospital pharmacy internship as his experience requirement would thereby be barred from examination; on the other hand the graduate who has only retail experience is welcomed to examination as qualified, in a practical way, to practice wherever he chooses. Does this system "assure a well rounded practical experience" as intended in regulation 2 for those entering hospital pharmacy?

It is not to be construed that this is in any wise an effort to question the over-all value of the N. A. B. P.'s action, which is certainly a step in the right direction. It is indeed encouraging to see concrete action on this long neglected weak point in our educational standards for licensure.

The regulations no doubt represent a compromise of different views, and also reflect the variations and inadequacies of some state laws. Most state laws reportedly now permit experience to be in either hospital or retail pharmacy. Others require that at least one-half of the required experience must be obtained in a retail pharmacy. Unfortunately some statutes seem to rule out any credit being given for experience gained in a hospital pharmacy.

This does not mean that hospital pharmacy must accept such laws, passed years ago, as always representing modern needs, nor accept regulation 2 of the new experience standards as the last word on this subject.

We predict continued dissatisfaction until the N. A. B. P.'s Committee on Study and Correlation of Practical Experience Requirements can show hospital pharmacy why regulation 2 should not be changed to permit full credit for hospital pharmacy experience gained in departments having the proper volume of professional practice and a licensed pharmacist in charge. We would not want such recognition, however, until this Committee has justified it by a study and inspection of operative and physical aspects of hospital pharmacy.

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HOSPITALS BUILT WITH FEDERAL AID MUST MEET STANDARDS

Certain standards of construction and equipment have been established by the Surgeon General, U. S. Public Health Service, for all projects built under the Hospital Survey and Construction Act. The standards, which were required by the Act, constitute minimum requirements to insure properly planned and well-constructed hospitals and health centers. As minimum requirements, it is pointed out that they should form a basis only for the development of higher standards. Copies are available to persons interested in the program.

Site, architectural, structural, mechanical and drawing specifications are not meant to coincide with all of the various state and local codes and regulations. However, strict compliance with all applicable state and local regulations is required. The standards, recently drafted by the Office of Technical Services, Division of Hospital Facilities of the U. S. Public Health Service, have been approved by special committees of the American Institute of Architects and the Federal Hospital Council.

TUBING MAY AFFECT PENICILLIN

Rubber tubing intended for use in parenteral administration of penicillin and streptomycin should be checked for inactivating effects. In a study to determine the effect of various types of rubber tubing upon the stability of these two antibiotics, solutions of penicillin and streptomycin were placed in separate sterile three-foot lengths of tubing. Glass tubing was used as a control. At the end of six and twenty-four hours samples were withdrawn and assayed.

Of 11 samples of synthetic rubber tested, 4 inactivated penicillin completely in twenty-four hours. Two other samples caused 64% and 84% reductions in the activity of the penicillin during the same period. Of 5 samples of natural rubber tested, 1 pigmented sample inactivated penicillin completely in twenty-four hours.

Buna S rubber caused a 50% reduction in penicillin activity in six hours. Other samples of synthetic rubber reduced the activity of penicillin 20–30% in the same period. It was noted that white surgical Koroseal caused a drastic reduction in penicillin activity, while black synthetic Koroseal caused only a moderate inactivation of the antibiotic.

None of the samples of rubber tubing tested caused any reduction in the activity of streptomycin.—*Science, 104: 479 (November 22), 1946.*

VICE-CHAIRMAN OF THE A.S.H.P.

JENNIE M. BANNING

JENNIE M. BANNING, chief pharmacist at Bradford Hospital, Bradford, Pa., has been installed as 1946–1947 vice-chairman of the American Society of Hospital Pharmacists. A registered pharmacist in Nebraska, Iowa, Michigan, and Pennsylvania, Miss Banning has worked in the pharmacies at the St. Joseph Mercy Hospitals of Fort Dodge, Iowa, Ann Arbor, Mich., and Sioux City, Iowa. Her wide experience as a hospital pharmacist is supplemented with knowledge of hospital work gained in early life at the hospital which her mother superintended. Here she acquired a great deal of practical experience as a helper in the various departments of the hospital.

Miss Banning was born in Nehawka, Nebr., where she attended grammar school, later going to a rural school near Pleasanton. Her high school work was taken in a convent in York, Nebr. Following a year at University of Colorado, Miss Banning attended the University of Nebraska where she received a B.S. degree in pharmacy. She has also had a one-year research fellowship at the University of Nebraska. While in college she was affiliated with Zeta Tau Alpha, Iota Sigma Pi, Sigma Delta Epsilon and Kappa Epsilon, serving as president of the latter organization.

In addition to being active in the American Society of Hospital Pharmacists, Miss Banning is a member of the AMERICAN PHARMACEUTICAL ASSOCIATION and the Pennsylvania Pharmaceutical Association.

(For biographical sketch of Chairman Hansen, see November, 1946, issue.)

Council descriptions of drug products are published regularly in THIS JOURNAL *as they are accepted. Rules upon which the Council bases its action appeared in the July (7:320) 1946 issue, and may be secured in pamphlet form upon request to the Secretary, Council on Pharmacy and Chemistry, American Medical Association, 535 N. Dearborn St., Chicago 10, Ill.*

BACTERIAL VACCINE MADE FROM H. PERTUSSIS COMBINED WITH BACTERIAL ANTIGEN MADE FROM H. PERTUSSIS.—Pertussis Endotoxoid-Vaccine—a suspension of Hemophilus pertussis, phase I organisms, in a solution of H. pertussis endotoxoid. The bacterial suspension is prepared after the technique of Kendrick and Eldering, and the endotoxoid by the Strean method.

Actions and Uses.—Pertussis endotoxoid-vaccine is recommended for the active immunization of individuals who are susceptible to pertussis. It is not intended for treatment of the disease or for the production of immunity once exposure has taken place.

Dosage.—For children 4 years of age and older a total amount of 6 cc. should be administered subcutaneously in four doses twelve to fourteen days apart as follows: 1 cc., 1.5 cc., 1.5 cc., 2 cc. For children under 4 years of age the dose may be reduced for the initial injection; a satisfactory dosage schedule consists of five injections, also at twelve to fourteen day intervals, as follows: 0.5 cc., 1 cc., 1 cc., 1.5 cc., 1.5 cc. After completion of the preliminary course it is customary to give a fortifying dose of 2 cc. (one injection) each year up to 5 years of age. When it is inconvenient to have the patient return for injections more than three times, three injections can be given at twelve to fourteen day intervals, as follows: 1 cc., 2 cc., 2 cc. Dosage intervals of one month may be preferred in cases ni which the additional length of time required for vaccination is not objectionable.

AYERST, MCKENNA & HARRISON, LTD., NEW YORK

Pertussis Endotoxoid-Vaccine: 6 cc. vial (one immunization) and 24 cc. vial (four immunizations). Each cubic centimeter contains approximately 15,000 million killed H. pertussis (phase I) suspended in formalin-detoxified antigen (endotoxoid). Preserved with Merthiolate 1:20,000.

U. S. patent 2,371,002.

PENICILLIN OINTMENT See (*J. Am. Med. Assoc.* Nov. 2, 1946, p. 515).

The following dosage forms have been accepted:

E. R. SQUIBB & SONS, INC., NEW YORK

Penicillin Calcium Ophthalmic Ointment: 3.6 Gm. tubes. Each gram contains 1,000 units of penicillin calcium in a base consisting of petrolatum 40 per cent, beeswax 4 per cent, anhydrous lanolin 10 per cent and peanut oil approximately 46 per cent.

SCHENLEY LABORATORIES, INC., NEW YORK

Penicillin Calcium Ointment: 28.35 Gm. tubes. Each gram contains 1,000 units of penicillin calcium in a base consisting of white petrolatum, U. S. P., 78 per cent, mineral oil 3.5 per cent, beeswax 3.5 per cent and anhydrous lanolin, U. S. P., 15 per cent.

THEOPHYLLINE ETHYLENEDIAMINE (See New and Nonofficial Remedies, 1946, p. 395).

The following additional dosage form has been accepted:

H. E. DUBIN LABORATORIES, INC., NEW YORK

Aminophyllin Rectal Suppositories: 0.5 Gm.

SODIUM IODIDE (See New and Nonofficial Remedies, 1946, p. 482).

The following dosage form has been accepted:

THE WM. S. MERRELL CO., LOESER LABORATORY DIVISION, CINCINNATI

Solution Sodium Iodide (10% w/v): 10-cc. and 20-cc. ampuls. Each 10 cc. contains 1 Gm. of sodium iodide.

ADDRESSES WANTED

MAIL addressed to the following A. PH. A. members has been returned by the post office. If any of our readers know the present address of any of those listed below it will be greatly appreciated if they will furnish us with this information.

Agee, Warren D.
Barnes, Mrs. Charles R.
Bottecelli, Paul
Carr, Vincent P.
Ferrer, Alvin J.
Fries, Edwin R.
Gillespie, Gloria
Hilsher, John M. (Lt. Col.)
Kyburz, Carl E.
Larnce, Paul C.
Loffredo, Anthony P. (Lt.)
Meisel, Leo
Roberts, Hazel Anne
Saba, Herbert
Schneller, George H.
Sullivan, Alice P.
Thober, William A.
Varney, Edward Francis
Vincent, Muriel E.
Voiss, Arcadius
Walbrach, Arthur
Williams, George Wesley
Zola, Mrs. Remo J.

Crystalline Penicillin Sodium...

No refrigeration required. This form of Heyden Penicillin Sodium may be stored at room temperature. In vials of 100,000-200,000-500,000 units.

Penicillin-Sodium...

For intravenous or intramuscular injection when the infective organism is susceptible to the action of penicillin. In vials of 100,000-200,000-500,000 units.

Penicillin in Oil and Wax...

For prolonged therapeutic action with less frequent injection. In 10cc vials, 300,000 units per cc for intramuscular and subcutaneous use only.

PENICILLIN-HEYDEN is available to selected pharmaceutical manufacturers for marketing under their own labels.

FINE HEYDEN CHEMICALS

HEYDEN Chemical Corporation

393 SEVENTH AVENUE, NEW YORK 1, N. Y.

Chicago Sales Office: 180 N. Wacker Drive, Chicago 6, Ill.

ADR

DENTAL REMEDIES RECENTLY ACCEPTED BY A. D. A. COUNCIL ON DENTAL THERAPEUTICS

Admission to Accepted Dental Remedies *means that a product and the methods by which it was marketed at the time of consideration were not found to be in violation of the published rules of the Council on Dental Therapeutics. A summary of the rules appeared in This Journal, 7:153 (April), 1946. Accepted products are reconsidered periodically.*

ANTISEPTICS AND ANTIBIOTICS[1]

Penicillin Chewing Troches, Squibb: Round, flat, flavored, yellow troches, each containing 20,000 units of penicillin calcium.

Indications: Penicillin Chewing Troches may be used as an adjunct to the basic manipulative treatment of Vincent's infection and other diseased conditions of the mouth in which the infecting organisms are susceptible to penicillin, provided the action of chewing is not detrimental. Chewing slowly releases the penicillin content from the troche and is said to produce a high and continuous concentration of penicillin in the saliva.

Local Effects, Systemic Toxicity and Actions: See "Penicillin," A.D.R., Ed. 12, p. 103.

Dosage: The recommended dosage is 3 or 4 troches a day, each troche being taken after a meal and kept in the mouth until the next meal, or until bedtime, being chewed every minute or so. When high continuous concentrations of penicillin are desired, a troche may be chewed each hour or two.

Penicillin Chewing Troches, Squibb, in boxes of 6.

Manufactured by E. R. SQUIBB & SONS, NEW YORK.

ANESTHETICS—LOCAL[2]

Procaine HCl 2%, Epinephrine 1:25,000- "Oryl" Brand:

Procaine HCl 2%, Epinephrine 1:50,000- "Oryl" Brand:

Procaine HCl 2%, Neo-Synephrine HCl 1:3500- "Oryl" Brand: Composition: See Exodontia Products Co., Chicago. Distributed by DENTAL PRODUCTS COMPANY, CHICAGO.

DENTURE ADHESIVE POWDERS

At its annual meeting on April 5 and 6, 1946, the Council on Dental Therapeutics voted to accept certain brands of denture adhesive powder, subjcet to its rules and to the following special provisions:

1. All advertising, labeling and educational material must have been passed upon favorably by the Council office before they are used. The Seal of Acceptance or any statement to the effect that the product has been accepted by the Council on Dental Therapeutics must not appear on the package until all distribution by the firm of advertising, educational material or labeling which has not been passed upon favorably by the Council office has been discontinued.
2. Samples shall not be distributed knowingly to persons other than dentists. This provision shall not apply to distribution of samples in customary and reasonable quantities to persons in attendance at commercial exhibits held in connection with meetings of the American Dental Association or its component or constituent societies.
3. Samples shall not be supplied knowingly either directly or indirectly to any mail-order denture house or dental laboratory.
4. The following statement shall appear on every trade package: "Ill-fitting dental appliances may impair health—consult your dentist regularly." The Council will give consideration to alternative statements designed to accomplish the same effect.
5. Acceptance will not be announced until the Seal of Acceptance appears on all trade packages.

The Co-Re-Ga Chemical Company, Inc., has met the foregoing provisions to the best of its ability, considering the shortages of packaging materials which exist today. Announcement of acceptance of Co-Re-Ga Denture Adhesive Powder is therefore made.

Co-Re-Ga Denture Adhesive Powder: Each 100 gm. is stated to contain karaya gum, 98.186 gm.; magnesium carbonate, U. S. P., 0.274 gm.; methyl salicylate, oil of peppermint, menthol, 0.068 gm.; and gum resin, 1.472 gm.

Manufactured by COREGA CHEMICAL COMPANY, INC., Cleveland, Ohio.

WRITER WANTED

MANUFACTURER of ethical pharmaceutical products has opening for writer in the field of medicine, pharmacy or related scientific papers. Should have degree or good background in medicine, physiology, biochemistry or similar subjects. Experience as medical editor or other scientific background desirable.

Will prepare first drafts of circulars on new products, and basic scientific material for advertisements; scientific editing and criticism of technical correspondence and advertising material; writing of scientific articles dealing with clinical and other experimental work done in our own laboratories or by outside consultants.

Headquarters in Philadelphia, but considerable travel may be necessary.

Excellent opportunity for advancement; five-day week; pleasant working conditions.

In first letter submit full personal and professional data and record of employment. Answers will be treated in confidence. Our employees know of this advertisement.

DEPT. MR P.O. BOX 599
WM. PENN ANNEX, PHILADELPHIA 5, PA.

[1] *Accepted Dental Remedies*, Ed. 12, p. 103.
[2] *Accepted Dental Remedies*, Ed. 12, p. 48.

ADDISONIAN PERNICIOUS ANEMIA TREATED WITH FOLIC ACID

Administration of the synthetic L. casei factor (folic acid) in pernicious anemia resulted in higher recticulocytic responses than that shown after intramuscular liver therapy. Six patients having addisonian pernicious anemia showed clinical improvement and hematologic remission after the administration of synthetic folic acid, either orally or parenterally. During the period of observation, no parenteral therapy other than synthetic folic acid was administered to any patient, and no iron or other antianemic substances were given. The drug appeared to be well tolerated when given by oral or intramuscular routes by all patients treated.

Though the clinical trials have been successful, clinicians at St. Luke's Hospital, New York, conclude that a detailed comparison of the results obtained with synthetic folic acid and those obtained with liver is not warranted at present.

—J.A.M.A. 131: 1201, 1946

℞℞℞℞℞

WATCH INCOMING MAIL FOR YOUR PLEDGE CARD

—℞—

OBSERVE PHARMACY WEEK APRIL 20–26

—℞—

AN EXPANDED PROGRAM FOR EVERY PHARMACIST

FROM THE SECRETARY'S NOVEMBER DIARY

—1st—

ATTENDING a most interesting conference called by the A. M. A. Council on Pharmacy and Chemistry at A. M. A. headquarters in Chicago to discuss with representative manufacturers the recently revised rules of the Council. Constructive suggestions offered all around. It was plain that Austin Smith, able secretary of the Council, has succeeded in removing previous industry resistance to Council policies and is receiving active cooperation of all concerned in making A. M. A.'s "seal of approval" mean more and more.

After luncheon at the Kungsholme, a further meeting of the Council on Pharmacy and Chemistry and advisers. Discussion of warning-notice requirement on prescriptions revealed that A. M. A. and A. PH. A. are thinking along the same lines. Both feel that the doctor alone should determine directions to patients. After a delightful group dinner at the Palmer House, spent what was left of the evening in conference on pharmaceutical topics.

—2nd—

Continuation of A. M. A. Council on Pharmacy and Chemistry meetings with many important topics up for discussion, including reports from the new Therapeutic Trials Committee; also learning something of plans to observe the centennial of the founding of the A. M. A. which was organized just five years before the founding of the A. PH. A. Final Council adjournment and luncheon at A. M. A. headquarters; and then home on "The General," which started on time and early enough to permit a good five hours of reading and writing before the porter insisted on making up the berth.

—3rd—

Arrived 8:15 a. m. at Trenton after an uneventful journey and a good night's sleep on the train. And now swiftly by automobile to Red Bank to spend the day at home where the mail from Washington awaited.

—4th—

By automobile to Easton, Pa., to finish up some delayed JOURNAL assignments and to confer with the printer on various publication matters, spending the night at Easton Hotel.

—5th—

Early to the Mack Printing Co. to read proof on copy left the night before, and then merrily on our way, stopping at Clinton, N. J. (birthplace of Lucius L. Walton), for the midday meal. At Trenton boarded the 4:35 for Washington, arriving in good

time to spend the evening with accumulated mail and the dictaphone.

—6th—

At lunch with the staff discussing happenings of the past few days. Completed the mailing of more than 8000 ballots for the election of officers for 1947–1948 by mail.

—7th—

All day working with the Committee on Uniform State Laws of the National Drug Trade Conference, preparing for the final report to be submitted to the full Conference tomorrow. At night and into the "wee small hours" of the morning completing the report and putting the finishing touches on the Uniform State Barbiturate Act.

—8th—

Most of the day attending the annual meeting of the National Drug Trade Conference, which received the report on uniform laws with considerable enthusiasm. More harmony and greater accomplishment at this meeting than can be recalled of any other meeting within a decade.

—9th—

This Saturday morning with the office "closed" reviewed the coming Pharmacy Week Program with Executive Director Poteat of the American Cancer Society and Editor Sonnedecker. Later at luncheon to discuss publication matters with Editor Powers of the *Scientific Edition* of the JOURNAL.

—12th—

A visit to the Merck Laboratories at Rahway discussing totaquine, quinidine and many other drug problems with J. J. Kerrigan and others. Next a meeting with New Jersey pharmacists at Newark and then to Washington on the Congressional, arriving in time to scan the mail before the curfew.

—13th—

The big event of this day was Surgeon-General Kirk's luncheon at the Army and Navy Club for the Steering Committee which is working on the Pharmacy Corps bill. It seems there can no longer be any doubt that the Surgeon-General means to utilize pharmacists in the Army to their full capacity. Later in the day some conferences on proposals to set up an Economic Council to advise all branches of the government on what is truth and what is best for our form of government.

—15th—

Another round with the attorney who drafted the uniform barbiturate bill, smoothing out language and coordinating the sections. To dinner at the Carleton with Arthur Peterson, A. PH. A. life member who has long been active in promoting the professional interests of pharmacists and who believes that the best interests of the drug industry demand strong support of the A. PH. A.

—16th—

This Saturday morning at headquarters, where came President Serles directly from the Southeastern Conference held at Charleston, S. C. Much interchange of information and progress in the plans for 1947 activities. To the Hot Shoppe for lunch,

one of the oldest and most reliable Protections *against* Infection

For cuts, abrasions and minor wounds suggest Official 2%

IODINE

PREPARATIONS

MILD TINCTURE OF IODINE U.S.P. XII

Mild Tincture of Iodine may be prepared as follows:

Iodine .....20 Gm.
Sodium Iodide .....24 Gm.
Diluted Alcohol, a sufficient quantity, to make .....1000 cc.

Dissolve the iodine and sodium iodide in a sufficient quantity of diluted alcohol to make product measure 1000 cc.

SOLUTION OF IODINE U.S.P. XII

Iodine .....20 Gm.
Sodium Iodide .....24 Gm.
Distilled Water, a sufficient quantity, to make.....1000 cc.

Dissolve the iodine and sodium iodide in 50 cc. of distilled water, then add sufficient distilled water to make the product measure 1000 cc.

Iodine Educational Bureau, Inc.

120 Broadway, New York 5, N.Y.

joined by Justin Powers; and at night to dinner at the Occidental continuing there and far into the night a complete review of all A. PH. A. activities to date with President Serles.

—17th—

Continuing discussions on A. PH. A. affairs with President Serles at breakfast, and later discussing the joint meeting agenda for A. PH. A. and N. A. R. D. executive groups until he had to leave on the Capitol Limited for Chicago. This two-day session with our president helped to bring us up to date on current pharmaceutical and medical developments.

—18th—

All the morning on the heavy mail and the agenda for the coming joint A. PH. A.–N. A. R. D. executive-group meetings scheduled for next Saturday. Now to spend the night at home and journey to Trenton tomorrow for the monthly meeting of the State Board of Health.

—19th—

After a full day of committee and Board meetings in the Board of Health office settling many a question of policy, a swift ride by train to Washington and an evening session at headquarters. The mail these days is heavy with ballot envelopes, indicating great interest in the election of A. PH. A. officers.

—20th—

Most of the morning reviewing the A. PH. A. Employees' Retirement Program as set forth in the insurance contracts, and then the final touches on the joint meeting and A. PH. A. Council meeting programs for Friday and Saturday.

—21st—

After a hectic day disposing of this and that at the office, departed on the "Capitol Limited" for Chicago, meeting George Beal on board for a profitable night session on Council business. Developing a bad case of laryngitis which reduced the voice to a whisper and made conversation less one-sided.

—22nd—

Early arrival in Chicago and, after some argument, a room at the Stevens Hotel which took care of us temporarily. To the College of Pharmacy of the University of Illinois, where the dean, A. PH. A. President Serles, proved a splendid host to the Council whose members arrived in accordance with railroad schedules. Those coming on the Pennsylvania were latest, as usual.

A profitable meeting, both morning and afternoon, interrupted by a delightful luncheon with Dakota pheasant, bagged by Dean Serles himself, as the piéce de résistance.

Late in the afternoon joined the University of Illinois A. PH. A. Student Branch, presided over by Ray Dauphinais, and members of the Council were introduced to the student members by President Serles. Chairman Beal gave a most interesting and inspiring talk on A. PH. A. tradition and accomplishment, which these future A. PH. A. members seemed to appreciate greatly.

To the Stevens for a group dinner in the Oak Room and then a further Council meeting, reviewing tomorrow's agenda. And the laryngitis is making headway to the great annoyance of listeners and some embarrassment, though little discomfort, to the "laryngee."

—23rd—

All day at the Sherman Hotel where the Council of the A. PH. A. met with N. A. R. D. Executive Committee, which was this year's host for the joint meeting, including a delightful luncheon. Every item on the long program was touched upon in the discussion over which Frank Moudry presided ably, with George Beal as co-chairman. As customary, a resolutions committee noted the concensus and phrased the intended action on items warranting an expression from this joint group.

—24th—

And now the final meeting of the Council for this session. Ratification of resolutions and disposal of much routine business by 1 p. m. Later to dinner at the Stevens with Council members waiting to leave on the afternoon trains.

—25th—

Arriving at Washington ahead of schedule and after a quick stop at the hotel, moved on to headquarters where there was much routine to take up this and the succeeding days.

—28th—

Now home for the Thanksgiving turkey and loafed all day thinking of the many things to be thankful for, including an occasional opportunity to enjoy the luxury of loafing.

—29th and 30th—

Enjoying the week end at home but not without having the long distance operators from here and there catch up with us and bring us good tidings and some not so good. And now another month completed with much unfinished business remaining.

Pharmacy Chemistry

Applications now being received for September, 1948 entering classes, courses leading to B.Sc.,

PHILADELPHIA COLLEGE OF

43rd Street, Kingsessing and Woodland Avenues,

Biology Bacteriology

degree in Pharmacy, Chemistry, Bacteriology or Biology. Graduate instruction also offered.

PHARMACY AND SCIENCE

Philadelphia 4, Pa. Founded in 1821.

two weeks for an answer

When the diagnosis of male climacteric is suspected but not definitely proved, a therapeutic test with ORETON (testosterone propionate) will provide the answer in two weeks. If androgen deficiency is the cause of symptoms, they will be alleviated by intramuscular injections of male sex hormone as ORETON 25 mg. daily for 5 days weekly over a two weeks period. Subsequently, manifestations of the male climacteric may be controlled with the same dosage injected two or three times weekly, and eventually equilibrium can be maintained with ORETON-M (methyltestosterone) Tablets.

ORETON

ORETON (testosterone propionate in oil), for intramuscular injection, in ampules of 1 cc. containing 5, 10 and 25 mg., in boxes of 3, 6 and 50. Multiple dose vials of 10 cc., 25 mg. per cc. Box of 1 vial. ORETON-M (methyltestosterone) Tablets 10 mg., in boxes of 15, 30 and 100.

Trade-Marks ORETON and ORETON-M—
Reg. U. S. Pat. Off.

SCHERING

Schering CORPORATION • BLOOMFIELD, N. J.
IN CANADA, SCHERING CORPORATION LIMITED, MONTREAL

A. Ph. A. Branches

LOCAL BRANCHES

NEW YORK—More than 75 members and friends present at the November branch meeting heard Dr. Louis Hirschhorn, associate professor of medicine at Flower Fifth Avenue Hospital, discuss "Styles and Fads of Medicine from the Physician's Viewpoint." He described the practice of medicine during the fifteenth century when great stress was placed upon bleeding the patient and using harsh purgatives. Continuing, he mentioned new drugs and treatments used during the past twenty-five years, supplementing his discussion by actual cases from his practical experience.

Formation of a Public Health Council of Greater New York was announced by Chairman Calvin Berger of the Professional Relations Committee. Organized pharmacy in New York City will participate in this council, the purpose of which is to maintain a close working relationship among official agencies concerned with the health of the public.

NORTHERN CALIFORNIA—Harry W. Hind of Barnes-Hind Laboratories spoke on "Hydrogen Ion Concentration" at a recent meeting held in Berkeley. During the lecture Mr. Hind gave formulas for the most commonly used ophthalmic solutions and emphasized the importance of using the correct buffer solutions to maintain the proper *p*H.

A detailed summary of the national A. PH. A. convention held in Pittsburgh was given by Louis Fischl, the branch delegate.

"Penicillin in Treatment of Venereal Diseases" was discussed by Dr. Richard A. Koch, chief of San Francisco Hospital Venereal Department, at the November meeting. An analysis of the effectiveness of penicillin in controlling the venereal rate in San Francisco during the last three or four years was given in Dr. Koch's report.

NORTHWESTERN OHIO—New officers elected at the November meeting are: President Joseph E. O'Donnell, Vice-President Laverne T. Olmstead, Secretary Walding G. Rupp and Treasurer Carlton S. Siegel. New directors include Eugene B. Imholt, Casimir M. Lenga and Jason P. Ott.

The principles of the electron microscope and a demonstration of its use on pharmaceutical preparations was presented by Dr. Archie N. Solberg, Toledo University biologist and director of the University Research Foundation. Following the lecture, those attending had an opportunity to inspect the electron microscope.

NORTHWESTERN—Newly elected officers of the branch are Kermit C. Mattison, president and Prof. Willard J. Hadley, secretary-treasurer.

BALTIMORE—Continuing a series of addresses being given on modern pharmaceutical practice, Dr. Noel E. Foss of Calco Chemical Co. discussed "Dispensing of Drugs in Micro-crystalline Form" at the November branch meeting. A demonstration accompanied the lecture.

STUDENT BRANCHES

ILLINOIS—More than seventy-five new students have joined the branch for the current year. Officers of the branch are President Ray Dauphinais, Vice-President Arnold Rife, Secretary Janet Corgan, and Treasurer Frances Fenton.

MONTANA—Thirty additional new members have joined the branch. In addition to the regular meetings, for which motion pictures and talks by guest speakers have been scheduled, the branch sponsored the annual pharmacy ball in December.

WATCH INCOMING MAIL FOR YOUR PLEDGE CARD

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OBSERVE PHARMACY WEEK APRIL 20–26

℞

AN EXPANDED PROGRAM FOR EVERY PHARMACIST

New A. Ph. A. Members

The American Pharmaceutical Association extends a cordial welcome to the men and women joining in its expanded program on behalf of the profession. Those accepted for active membership during the month preceding September 20 are listed below.

NEW LIFE MEMBERS

Lordi, D. George, Irvington, N. J.
Evans, Charles H., Warrenton, Ga.

CALIFORNIA

Francisco, Charles H., San Francisco
Harding, Chester E., Santa Monica
Harlan, Wilton O., Oroville
Jennings, Howard W., Berkeley
Leach, John H., Berkeley
Lewis, Kenneth K., San Francisco
Libkitz, Henry, Berkeley
Morita, Sue, San Francisco
Murray, Donald E., Berkeley.
Pletcher, Ralph R., Berkeley
Williams, E. George, Berkeley
Young, William W., Berkeley

DISTRICT OF COLUMBIA

Wolfe, Eddie, Washington

GEORGIA

Drew, E. A., Americus
Joyner, Mrs. Frances W., Atlanta
Parks, J. H. H., Jr., Columbus
Timmerman, Louis B., Americus

ILLINOIS

Blann, Viola H., Kenilworth
Charles, Augustus L., Winnetka
Coleman, Richard D., Chicago
Conney, Leo Y., Winnetka
Häering, George Victor, Chicago
Harris, Kenneth H., Chicago
Jacobson, Raphael, Chicago
Kettering, Mrs. Mabel L., Chicago
O'Brien, John Louis, Chicago
Phelan, Harry J., Winnetka
Poska, Sophia F., Chicago
Rehn, Theodore L., Glencoe
Rosenburger, Paul W., Chicago
Schmid, Harold H., Chicago
Semple, J. Howard, Chicago
Smith, Austin, Chicago
Zabella, Mrs. Helen, Chicago

INDIANA

Rogers, Marian E., Fort Harrison, Ind.

IOWA

Kerr, Wendell L., Iowa City
Roth, Lloyd J., Iowa City

KANSAS

Barber, Vernon E., Manhattan
DeGoler, Harvey, Kansas City
Kenball, John C., Lansing

MARYLAND

Sterling, Alonzo L., Chestertown

MASSACHUSETTS

Hackett, Joseph John, Belmont
Kelleher, J. Robert, Brockton

MICHIGAN

Alexander, John, Ann Arbor
Apple, William S., Detroit
Banks, Clarence K., Detroit
Cowan, Philip Edward, Highland Park
Crandell, H. C., Ann Arbor
deGwise, Alfred F., Jr., Ann Arbor
Drake, G. Claude, Ann Arbor
Greene, Russell H., Ypsilanti
Nelson, James L., Lincoln Park
Parker, William M., Ann Arbor
Picchioni, Albert L., Ann Arbor
Reynolds, William R., Ypsilanti
Tilford, Robert, Ann Arbor
Woodford, Leon V., Ann Arbor
Yerby, Paul A., Detroit

MINNESOTA

Wold, Guy K., Austin

MISSISSIPPI

Allred, Cecil L., Hazlehurst
Bradford, W. H., Jackson
Cowsert, Hugh I., Goodman
Crawley, Homer B., Brandon
Deerson, B. B., Jackson
Oilschlager, Carl A., Meridian
Parkin, S. N., Jackson
Sumner, Walter H., Nettleton
Tutor, Jessie B., Oxford
Welch, Walter F., Jackson
Williams, John Alfred, Pontotoc

MISSOURI

Giessing, Milton H., St. Louis
Rheinfeld, Edward B., St. Louis

MONTANA

Holden, Archie R., Worden
Peterson, Alex F., Missoula
Von Segen, Mrs. Dorothy D., Lonepine

NEW JERSEY

Arky, Arthur, South Amboy
Arnoldi, Charles H., Union City
Band, Jacob, Union City
Barrett, Thomas J., Ridgewood
Basson, Phillip, Perth Amboy
Bastian, Ernest J., Nutley
Belafsky, Harry, Highland Park
Boggs, H. R., Keyport
Buhler, Emil G., Roselle Park
Catena, Mrs. Anna L., Newark
Colacurcio, D. A., Jersey City
Davis, Philip, West New York
Delius, Theodore F., Morris Plains
Dern, Murray, Perth Amboy
Doctofsky, Maxim, Woodbridge
Duschock, Stephen M., South River
Fullaway, Harold C., East Orange
Gaynor, Ted, Perth Amboy
Gilmore, Robert R., West New York
Goldman, Theodore, South River
Gursky, Joseph, Cranford
Hasenbalg, Catherine, Jersey City
Hawthorne, Kenneth C., Pompton Plains
Joswick, Ludwig, Perth Amboy
Kocher, William A., Carteret
Kovacs, Walter, Avenel
Kressaty, Fred, Union City
Lardier, Amuel E., Nutley
Lebow, Carlton, West New York
Leonhardt, Philip, Jr., Roselle
Lubman, Abraham, Woodbridge
Margulies, Harry P., Coytesville
Marra, Gerald A., Secaucas
Mitterman, George, Jr., Elizabeth
Mittuch, J. W., Carteret
Musto, William V., Union City
Myerson, Jerome H., Belleville
O'Donnell, John R., Bloomfield
Parentini, Robert L., Union City
Pernot, Jules S., Glen Rock
Pfeifer, Mrs. Helen, Jersey City
Rabiner, Boris I., Perth Amboy
Rosenblatt, Sydney, Hoboken
Shavelson, Norman, Guttenberg
Silk, Joseph C., Perth Amboy
Singer Isadore, Perth Amboy
Soliveau, William, Union City
Susser, Harry, Union City
Taber, Stephen C., Bloomfield
Tarloski, Edward P., Perth Amboy
Tortora, L. C., North Bergen
Vigdor, Philip, Newark 8
YaDeau, G. J., Palisades Park
Yakubik, Joseph, Ford

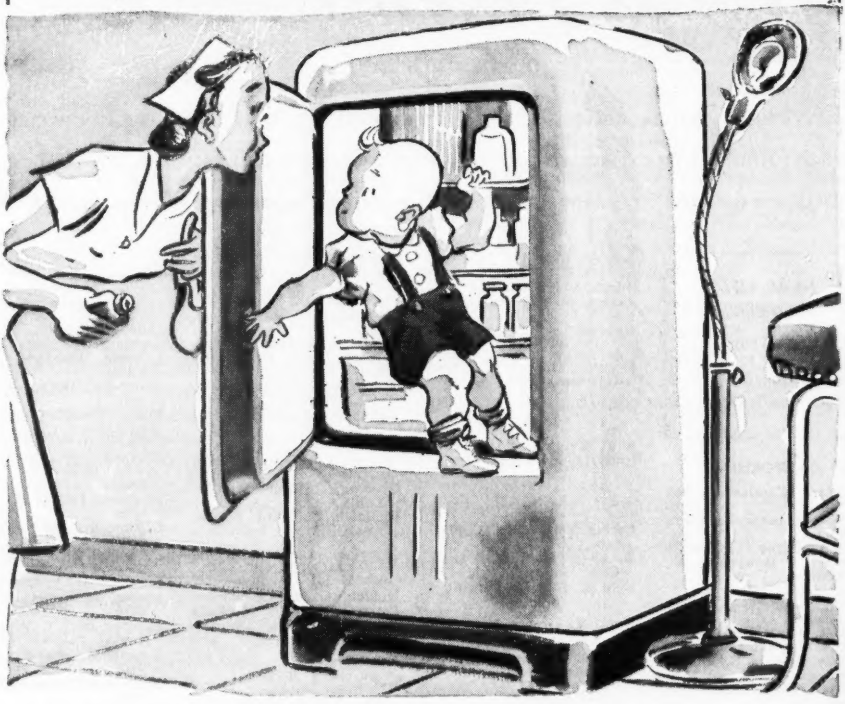
NEW MEXICO

Butler, James P., Clovis
Quisenberry, M. G., Albuquerque

NEW YORK

Allar, S. Sanford, Mt. Vernon
Cadman, M. Donald, Chappaqua
Cunningham, Raymond W., Pearl River
DeChristopher, Edward P., Peekskill
Jackson, Sidney J., Douglaston
Klinger, Max, Brooklyn
McKim, Orville E., Port Chester

"I'm just makin' sure the doctor uses D-P-T*!"



He's pretty smart—to look for better protection and less chance of reaction with Cutter D-P-T

With Phase I pertussis organisms *grown on human blood*, with toxoids *so purified* that each cc. contains far more than a single human dose . . . you avoid heterologous animal protein. Hence, with D-P-T, there is *less* chance for reaction or anaphylatic shock, *more* chance of establishing a high immunity level.

Too, with Cutter D-P-T, the concentration of both pertussis organisms and toxoids allows a more potent dosage in smaller volume. No king-size syringe to outrage mother or little darling. The dosage schedule with Cutter D-P-T is only 0.5 cc., 1 cc., 1 cc.

Cutter also makes D-P-T (*Alhydrox*), which offers even further advantages. It produces better immunity levels than alum precipitated vaccines. And, because of its more physiologically normal pH, it also presents less pain on injection. Persistent nodules and sterile abscesses are rare, rather than an expected contingency.

The demand for Cutter D-P-T—both Plain and Alhydrox—is sure to be steady. How is your supply?

**Cutter's brand of combined diphtheria, pertussis and tetanus antigens.*

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BROMIDE, ACETANILID DELETED FROM REMEDIES

THE Federal Trade Commission has closed without prejudice its cases charging the manufacturers of two well-known pain remedies with false advertising after they voluntarily altered the formulas of their products to eliminate ingredients alleged to be injurious to health when used to excess.

The respondents were B. C. Remedy Co., Durham, N. C., manufacturer of "BC Headache Powders," and a partnership trading as Stanback Co., Ltd., Salisbury, N. C., manufacturer of "Stanback Headache Powders."

Both manufacturers have eliminated from their products acetanilid and potassium bromide, the presence of which formed the principal basis for the charges of false advertising, the closing order said.

Simultaneous complaints had charged that advertisements of the BC and Stanback preparations were false because they failed to reveal the harmful effects attendant on continued use of the products in quantities exceeding the recommended dosage, or with greater frequency than that recommended.

Among the harmful effects of such excessive use the complaint listed dependence on the drugs contained in the preparations, skin eruptions, mental derangement and collapse. Administration of the products to children was also alleged to be potentially dangerous.

These harmful effects, the Commission said, "were caused solely by acetanilid and potassium bromide" contained in the preparations. With these drugs eliminated and new formulas and labels in use, approved by the Food and Drug Administration, the Commission held that "no additional benefits" would be obtained by issuance of cease and desist orders.

Not only have the respondents discontinued the dissemination of the advertising complained of, the Commission pointed out, but they have, "at substantial cost and expense," permanently removed from their preparations the ingredients which formed the principal basis for the allegations of the complaints.

The orders also noted that the respondents agreed that if they should hereafter use acetanilid or bromide in products sold in interstate commerce, the Commission may issue cease and desist orders on the basis of the evidence now in the records without further proceedings.

The Commission closed the cases in response to petitions filed by the respondents asking that action be suspended.

Noting that the Commission "has the power to control advertisements, but has not the power to change a formula or a label," each petition declared that the proceeding "not only accomplishes all that the Commission has the power to accomplish in the public interest, but goes further and in effect removes from the preparation of the respondent the ingredients which form the sole basis of the allegations contained in the Commission's complaint, and therefore removes (so far as this product is concerned) from the reach of the public the ingredients which the Commission alleges are injurious to public health when used to excess."

This ulcer healed in *5 weeks!*

—Patient, female, age 52. Large leg ulcer following trauma in street car accident 4 months previous. History: phlebitis 3 years before, followed by varicose veins. Previous treatment: wet compresses of epsom salts: boric acid: sulfathiazole ointment.

—Five weeks later. Ulcer completely healed. This rapid healing was accelerated by the bactericidal action of Intraderm Tyrothricin Solution. It presents much more effective germ-killing contact than suspensions of tyrothricin usually employed.

Faster healing means more prescriptions

• Your "Want" book will be telling you the results of intensive promotion on Intraderm Tyrothricin. More and more doctors are discovering Intraderm Tyrothricin is effective in healing pyodermas, such as folliculitis, furuncles, and ulcers. Proved clinical results show prompt healing is obtained even in stubborn cases.

Intraderm Tyrothricin contains a powerful, non-sensitizing antibiotic which is rapidly bactericidal to gram-positive organisms. The tyrothricin is incorporated in a unique skin-penetrating vehicle which assures effective contact for tyrothricin throughout the lesion.

This stable liquid contains 1,000 mmg. of tyrothricin *in true solution* (gramicidin 200 mmg.). Supplied in bottles of 120 cc.

INTRADERM TYROTHRICIN SOLUTION
REG. U. S. PAT. OFF.

New Emulsion Base Has Therapeutic Properties

• Your doctors are prescribing this antibiotic ointment for chronic and subacute dermatitis. They know Bactra-Tycin not only has rapid bactericidal properties but its creamy, white, oil-in-water base provides 5 essential healing steps.

1. CLOSE CONTACT
2. MISCIBILITY WITH SERUM
3. COOLING AND PROTECTIVE ACTION
4. TISSUE HYDRATION
5. DETERGENT ACTION

Bactra-Tycin Ointment contains 1,000 mmg. of tyrothricin per gram (gramicidin 200 mmg. per gram).

BACTRA-TYCIN OINTMENT
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ORDER FROM YOUR WHOLESALER

WALLACE LABORATORIES, INC. • NEW BRUNSWICK, N. J.